Manufacturing Urbanism

An architectural practice for unfinished cities

A project submitted in fulfilment of the requirements
for the degree of Doctor of Philosophy

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Declaration

I certify that except where due acknowledgement has been made, the work is that of the author alone; the work has not been submitted previously, in whole or in part, to qualify for any other academic award; the content of the thesis is the result of work which has been carried out since the official commencement date of the approved research program; any editorial work, paid or unpaid, carried out by a third party is acknowledged; and, ethics procedures and guidelines have been followed.

Gretchen Wilkins

August 2012

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All images are by author unless otherwise noted.

Table of Contents

Cities emerge through making things, including themselves.

The relationship between industrial manufacturing and urbanism is a shifting one: changes in the ways things are made effect significant and tangible change to the fabric and culture of a city, and vice versa. This work sits at the intersection of those practices, documenting shifts in manufacturing for architectural and urban work, and speculating about future urbanism in light of contemporary industry. A series of architectural projects, and ultimately a model of urban-architectural practice, are proposed, poised between states of urban and industrial change. Distributed and collective models of design and production are a primary focus and enabler of that work.

Chapter 1: Manufacturing Urbanism

Introduction

This work is a scholarly reflection upon an architectural practice developed over twelve years, primarily across two countries, the United States and Australia, and incorporating architectural design, teaching and writing. The practice has to date consisted of a variety of projects ranging from full-scale architectural interventions to speculative urban proposals, and includes individually authored work alongside collaborations with an international network of practitioners and academics. Addressing this constellation of projects and practices, the reflective process of this PhD identifies two primary conceptual domains and drivers of the work: contemporary industrial manufacturing and urban transformation. Rather than treating these as categorically distinct topics and organising projects accordingly, the reflection is conceived rather in terms of the bilateral play of urban and industrial motivations within the work, and the agency they afford. Indeed, attention to agency is central to this research, over and above an emphasis on the disciplinary context or status of specific projects. This is to say that 'urban-type' projects are often driven by industrial practices and vice versa; and also that investments in practice are not always-already linked to clear material outcomes. The categories of urban and industrial identify a mode of working or a trigger for design more than preforming the outcome. More importantly perhaps, they establish a productively indeterminate space of practice between them, and that is the primary focus of this research.

The Phd began from a survey of previous, current and proposed architectural work, and then continually repositioned projects into different ideational relations with each other and according to various modes of working. The attention to urban and industrial practices and contexts provided an initial framework for that process, and that bilateral organization in turn revealed new conceptual and practical alignments across, and gaps within, the ongoing design research. As such, the reflective process served to transform preliminary understandings of the practice under analysis – a seemingly indiscriminate variety of projects, collaborations and sites – into a consolidated, dual-focus framework for a larger approach to 'work'. By identifying these two primary drivers a third 'space' between them emerged, in which industrial and economic factors and material and urban conditions all productively collide.

Insofar as industrial and urban practices are perpetually (and rapidly) changing, their status – and the work that might be undertaken in the space between them – is continually in flux. This marks a highly productive territory for reflection on design practice, especially in order to examine the agency that 'incompleteness' has for architectural design and urbanism. In my own practice, and in this reflective research, the 'collision' between manufacturing and urbanism primarily involves coupling outmoded technologies, technical expertise and industrial materials with the distributed organisations of contemporary urbanism. The aim of that project is to establish a more flexible and expanded frame or 'platform' for future architectural practice, situated at the intersection of industrial and urban operations. The practice proposed as an outcome of this research is predicated on advancing the 'agency of incompleteness' as a strategy for future work. As such, the outcome is itself both complete and incomplete, a concluding work and a platform for future work.

The reflective process of the PhD has thereby served as a mechanism to experiment with new alignments across a collection of existing and ongoing work, to locate procedural, conceptual or cognitive gaps within design practices, and ultimately to enable a new model of practice to emerge – one that is situated at the intersection of contemporary manufacturing and urbanism. Accordingly, this PhD's key contribution to knowledge is its identification of specific modes of architectural work at this intersection; it provides a vehicle for conceptualizing an approach to practice, the ambition of which is to navigate the volatilities engendered by the territory that it identifies. This PhD articulates the research through three primary components, a) a reflection on two parallel architectural practices – one focused on industrial manufacturing and the other on urban change (Chapters 2-4), b) an investigation of the interstitial territory between these streams of work (Chapter 5), and c) a proposition for future architectural practice which endeavours to operate across that gap (Chapter 6). Each part consists of a series of projects and texts that narrow the broad territory of the research toward particular design outcomes, through built, speculative, written and photographic media. Projects dating from before the PhD commenced mark points of departure for the work undertaken here, from which only key ideas, methods or important failures are highlighted.

Locating the Practice: from constellation to orbit

While this research was developed in academic and professional contexts in Australia, it emerges from a legacy of Midwest American industry and urbanism, where I studied and first practiced architecture. This historical context to the practice cultivated a preoccupation with the relationship between industrial manufacturing and urban expansion that, while not exclusive to this region takes a particularly exemplary spatial, cultural and material form, and leaves an indelible mark on my work in general and specific ways. This especially concerns patterns of population migration, distribution and diaspora, the effects of which underlie the urbanism of this region and those like it. Industrial manufacturing and migratory urbanism, taken together, yield contrasting qualities: highly specific kinds of localness on the one hand and cosmopolitanism on the other. That is, a heightened dependence on one's immediate proximity (integration with local cultural) combined with a sense of indifference about place (one result of becoming a 'citizen of the world'[1]). These very broad, sociological statements are offered briefly here only to set the context of this body of work in the widest sense. In the context of architectural research, however, this background information is important for three reasons: 1) because of the implications it has on my own 'spatial intelligence'[2] and early architectural practice(s); 2) insofar as it establishes a link between the way things are made and how cities evolve, this becomes important for the trajectory of this research; 3) as a precedent that assumes instability as necessary and productive for urbanity, rather than trying to control or account for it. This last point serves as the intellectual and practical platform for my proposition for an architectural practice operating between industry and urbanism, and thereby a primary aspect of this doctoral work.

The early architectural work that I undertook in this material-geographical setting was within two practices, initially as a partner of Ply Architecture, and then as a founding partner of Wilkins + Comazzi Design, both in Ann Arbor, Michigan, 70 kilometres west of Detroit. From this launching point my work began to expand outwards to encompass an array of projects across a dispersed field of collaborators. It did so first geographically, toward 'sister' sites that demonstrated an affinity through industrial or urban conditions, such as Japan and China, and later, the UAE and Australia. The connections were specifically around issues of manufacturing and rapid population shifts, while also being based on broader economic exchanges, such as between the US and Japan, US and China, China and UAE and China and Australia. This work was generally concerned with

1. APPIAH, A. (2006) *Cosmopolitanism: Ethics in a World of Strangers*, New York, W.W. Norton & Co.

2 VAN SCHAIK, L. (2008) *Spatial Intelligence: New futures for architecture*, Great Britain, John Wiley & Son Inc.

how and where manufactured products were made, how the production patterns change, and how those changes inform or directly affect patterns of urbanism and urbanisation as a result. The practice unfolded through a series of design projects and collaborations around these questions, expanding in scope through the activities of design, writing and teaching. At the point of beginning this PhD, that overall body of work could best be described as a broad constellation of diverse projects and practices.

The reflective research process of the PhD, structured through biannual Graduate Research Conference (GRC) presentations at RMIT University, began to cultivate a stronger appreciation of the methods at work within this constellation, especially in relation to the urban and industrial conditions underpinning it. Indeed two concentrations of ideas became evident: projects around issues of materiality, industry and manufacturing on one side, and projects around issues of cities, post-industrial urbanism and rapid urbanisation (or de-urbanisation) on the other. These interests operated more or less discretely and in parallel: ideas about industrial manufacturing, materials and making were explored through design studios, commissioned design-build projects and with a particular cohort of collaborators; while investments in the transformation of cities and contemporary urbanism were explored with a very different set of collaborators, within research seminars (rather than design studios) and through the activities of writing and publication. Material projects were disseminated at conferences on fabrication research, such as the Association of Computer Aided Design in Architecture (ACADIA), while urban projects contributed to the research around contemporary forces of urbanisnisation, such as the Holcim Foundation Forum. The audiences, students, participants, critics and collaborators were similarly divided into these two discrete fields of practice, while I moved across them. In other words, the dispersed constellation of practices, upon reflection, now appeared more like twin poles around which projects and practices orbited.

"This is the first iteration of this code. There will be no final version"

– Michael Sorkin (3)

While this dual approach was not a premeditated focus, finally organising the work as such revealed a broader potential of binary frameworks in my design research and practice as a result. The structure of dualities and paired conditions is revisited throughout this document, not in an attempt for categorisation of ideas around them but with an ambition toward locating and testing the agency of working between two 'poles' - the ever-emerging yet potent 'third space'. In this light this research may more accurately be described as a tripolar framework as there are indeed three conditions at play, two edges and the center. However, the emphasis throughout is about working *between* these edges, extremities, or oppositional ideas rather than a tripartitie organisation or balance.

3 SORKIN, M. (1993) *Local Code: The Constitution of a City at 42N Latitude*, New York, N.Y., Princeton Architectural Press. p11.

In fact the 'third space' is never clearly defined, and it can't be. It emerges in response to the edges and even then only as a result of particular ideas or approaches at the edge 'migrating' toward each other. The third pole is indeed of primary importance, but it is never defined by one subject, idea or outcome.

"Incompletion and continuation are two sides of the same coin."

– Brian Massumi (4)

The bilateral framework is quite useful then, and the reflective research process has surfaced, perhaps encouraged, an underlying binary, or twinned approach to much of my work in general ways, a tendency to oscillate to and from strongly situated disciplinary poles. For example, projects reverberate between utopian and pragmatic ideals; link digital and material technologies; practice across local and remote boundaries; connect mass production with bespoke production, and situate design relative to extreme peaks and troughs of economic boom and bust. Of all of these oscillating dualities, aspects of locality and remoteness recur strongly, and establish an underlying a sensibility toward early work. This may be an extension of the broader cultural context of migratory and industrial urbanism described earlier, but it has also become an explicit framework guiding future practice.

Proposition: Creative Incompletion

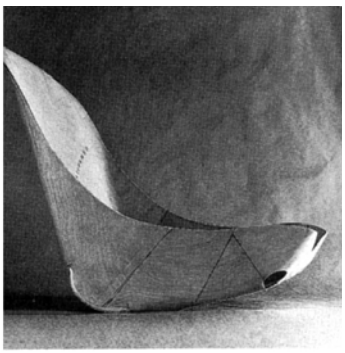
The observations emerging from this research, and the future practice proposed as a result, are explicitly predicated on locating and interrogating the creative potentials of the indeterminate or 'migratory' space between clearly defined edges. With this driving agenda the work encourages a predilection for, and prioritisation of, incompleteness in design, practice and urbanism. Incompletion is positioned as a source of vitality insofar as the inability of any project to complete itself triggers, indeed necessitates, continued work. Several examples of this approach will be discussed throughout this document, such as utopian schemes, which gain agency precisely through their impossibility; or Brian Massumi's discussion of 'creative incompletion' within architectural manifestos; or William Gibson's suggestion that 'uncooked' cities are inherently more innovative than complete ones. These are all touchstones for a proposition about the agency of incompletion in architectural and urban work, and will be elaborated on through a broader community of practice as well as my own.

4 MASSUMI, B. (2013) 'Becoming Architectural: Affirmative Critique, Creative Incompletion', in P. Ednie-Brown, M. Burry and A. Burrow, eds. in *The Innovation Imperative: Architectural Design*, Great Britain, John Wiley & Sons Ltd.

‘Creative incompletion’ can be evidenced in several ways, such as through open-ended or collaborative project structures, a focus on residual or speculative phases of urban change, and through adaptive application of industrial materials and techniques. Some projects reveal a latent tendency toward incompletion, while others employ a very deliberate strategy to perpetuate ongoing or open-ended design practice. All, however, consistently cultivate a broad and open embrace of change in their modelling – they emphasise a desire to keep things unfinished, or revive the discarded, or foster perpetual renewal.

This proposition is a direct outgrowth of the reflective process of this research, especially the shift in my own perception of my work and attention to the productive qualities of oppositional, or at least dualistic structures in design practice. The ‘migratory’ space between is where, in this work, industrial techniques come to bear on architectural form, or urban space is organised around patterns of manufacturing. This approach offers a more complex and sophisticated trajectory of the research, wherein the ongoing interplay between endlessly shifting industrial and urban practices might continually reinforce (or counteract) each other. This is a space of ongoing and unfinished practice that is by nature emergent, because the edges that define it are so also. Put another way, the space between the strongly defined edges of industry and urbanism only emerges precisely when they are put together as such, and so the agency of this space is yet, and always, to be defined.

The agency of incompletion in architectural and urban practices was both revealed through the reflective process documented here and also constitutes the proposition resulting from the research. A framework for professional architectural practice is proposed with the intention of advancing and facilitating models for this approach in architecture and urbanism. The practice is designed as a vehicle through which specific mechanisms for ‘creative incompletion’ can be proposed and tested. The unfinished, renewing and evolving quality of this approach is a function of continually operating in the space between phases, stages, authors or ideas.



Eames plywood chair and aircraft chair section.
(image from D. Albrecht: *WWII and the American Dream*)

Contribution to Knowledge

This PhD's contribution to knowledge in the field develops from the way in which it captures specific qualities and tactics of architectural practice positioned at the intersection of urban and industrial / material research. As a result of the research, the project assesses links between industrial manufacturing and urban change (growth or decline) and how contemporary and adapted industrial manufacturing techniques, tools and expertise (labour) impact upon urban space, and vice versa. The project also identifies links between specific economic, technological and cultural factors in this context, in order to address how experimental practices of architecture and urbanism inform and redefine professional ones. The research establishes the agency of incompletion in architectural and urban work, proposes a model through which this can be practiced, and demonstrates design research outcomes in that capacity. The PhD models a vehicle for practice using this framework, and demonstrates the manner in which urban and industrial relationships, in ongoing states of change, can be enacted architecturally, pedagogically and speculatively.

Community of Practice

This research sits within a larger community of practices that focus on urban transformation, contemporary manufacturing and alternative approaches architectural work. Its primary influences stem from the legacy of post-war urbanism and adaptive manufacturing process, particularly as seen in the Midwest of the United States. The context of the Midwest is suffused with a legacy of materials research, technological innovation and industrial architecture. More specifically, and historically, it includes the automotive innovations of Henry Ford and the architectural innovations of Albert Kahn, as well as a long history of research in architectural technology at the University of Michigan. Decades of experimentation in material and craft also took place in this context at the Cranbrook Academy of Art in Michigan; the academy's significant protagonists of innovation included Eliel Saarinen, Eero Saarinen, Charles and Ray Eames, Daniel Libeskind, Dan Hoffman and more recently William Massie. The combination of local influences situated in this concentrated space from Detroit to Cranbrook to Ann Arbor, and across the span of twentieth century architecture and design, heavily inform the origins of this work.

Influential experiments with industrialised housing and mass production after World War II are a secondary frame of reference. These include the commercialised, mass-produced housing systems of Levitt, Lustron, Eichler and Butler, as well as the architectural reactions to them, the most architecturally publicised being the 1945 Case Study House competition in California. The preoccupation of architects at that time (and still) with relationships between mass-production and customisation, and with adapting technologies from industrial to urban applications, resonated through my earliest research practices. In particular, my Master of Architecture thesis (1999) and Cleveland Case Study House competition entry (2001) were the first of many experiments with the relationship between manufacturing and urbanism, described in Chapter 4.

As the focus of my practice shifted from the Midwest to the California coast (via the case study project) the above reference points expanded to include projects and experiments in manufacturing and housing in Japan. In Japan I documented the expansion of American and Japanese automotive industries into the provision of housing, and the overlapping implications on architectural design, construction and urbanisation.[5] This research focused specifically on new and historical architectural practices, including Metabolist projects, Kazuyo Sejima's housing projects (Gifu and the Women's Dormitory) and a series of projects by the newly emerging Hitoshi Abe, who was experimenting with technologies adapted from the shipbuilding industry.[6] The history of adapted industrial manufacturing in architecture and urbanism is a history of techno-material experimentation, inherently invested in the efficiencies of materials, the efficacy of techniques, and the exigencies of particular political-economic (or military-industrial) circumstances. This includes Ford's factory conversions from cars to bombers, or the Eames's plywood airplane wings[7] and splints during World War II.[8]

Alongside the industrious pragmatism of applied manufacturing, however, is another type of experimental-technological history, one of fantasy and spectacle, imagination, science fiction and utopian schemes speculating about architecture's engagement with industry. This genre of architectural work captures a relationship between technology and urbanism through visionary approaches to 'the future', including the future of architectural practice itself. Special consideration is this PhD document is given to World's Fairs, especially inspired by their Industrial period (1851–1931), but also through contemporary examples. Some key moments for example, are Norman Bel Geddes's GM Pavilion (New York, 1939), the Eames' IBM Pavilion (New York, 1964), Diller & Scofidio's Blur Building (Yverdon-les-Bains, 2002) and MVRDV's Dutch Pavilion (Hannover 2000).

5 Japan External Trade Organization (JETRO) and Ministry of Construction (1951) Osaka

6 WILKINS, G. (2008) 'Body Building,' in G. Wilkins ed., Hitoshi Abe: On-The-Spot, Ann Arbor: Taubman College of Architecture, University of Michigan

7 FRIEDEL, R. (1995) "Scarcity and Promise: Materials and American Domestic Culture during World War II" in D. Albrecht, ed., *World War II and the American Dream*, Washington D.C., Cambridge and London, National Building Museum and MIT Press, p. 50.

8 see Donald Albrecht's (ed) *World War II and the American Dream: How Wartime Building Changed a Nation* (1995)

World's Fairs continue to be laboratories for testing visionary relationships between architecture and industry at full-scale, in public and for a client, offering a significant middle-ground between experimental and professional modes of architectural practice. Engagement with this history of visionary and experimental-professional practices has lent perspective to this PhD work, especially in establishing connections between technology and architecture, urbanism and prototyping.

While visionary projects of World's Fairs offer a material and technological legacy for creative practice in the present, bubble economies provide a parallel urban context for architectural thinking into the future. Radically speculative moments in any city's urban development present an equally important, if less utopian contribution to experimental architectural practices, and also for their consideration of relationships between architecture, technology and urbanism. This history is characterised by feats of engineering, superlative architectural ambition and fantastically concocted spatial environments, put to public use. In this PhD the context of bubble (and post-bubble) architecture and urbanism focuses on exemplary cities that demonstrate the effects and opportunities emerging in the aftermath of these exaggerated economic cycles. I am particularly interested here in the value of residual urban spaces and incomplete urban plans for new strategies and formations of architectural practice. Though focused on urbanism in the broader sense, these interests also relate to the PhD's treatment of industrial manufacturing in terms of adaptation and opportunism. Where Eames and Ford adapted manufacturing techniques from consumer to military production during World War II, post-bubble practices adapt extravagant plans and massive commissions down in to lean, nimble projects. That work is often revealed through a sort of forensic practice of taking stock and advantage of what remains in the wake of fleeting investment, working to develop architectural projects that cleverly reconfigure or enliven them. Tokyo, Dubai and Detroit offer key case studies for this section of research.

Lastly, this body of work is situated in dialogue with a series of practices and writers who have been influential in establishing the conceptual foundations upon which this work stands. Key is the work and figure of Buckminster Fuller, who has practiced at the intersection of wildly speculative yet utterly pragmatic techno-urban futures,[9] as well as the writings and projects of Michael Sorkin and Rem Koolhaas, who frame similar territories of practice and research in different ways for contemporary urban discourse. Visionary practices like Archigram and Superstudio are touchstones, as well as the work of the Smithsons[10] and CIAM. Fictional accounts of cities, such as those conjured by

9 Felicity Scott's writings on both Buckminster Fuller and Rem Koolhaas's Exodus project *Architecture or Techo-Utopia: Politics After Modernism* are influential and important touchstones to the work in this chapter and discussion of utopias in Chapter 2.

10 SMITHSON, A., SMITHSON, P. (2005) *The Charged Void: Urbanism*, C. J. Chung, ed., New York, Monacelli Press.

William Gibson and China Miéville also figure in this section for inspiration and cultural discourse, as does the work of technologists interested in the continually emerging relationships between technology and culture, such as Kevin Kelly and Stewart Brand. Finally, urban economists, particularly Jane Jacobs and Edward Glaeser[11] are referenced in consideration of economic relationships between production and urbanism over time.

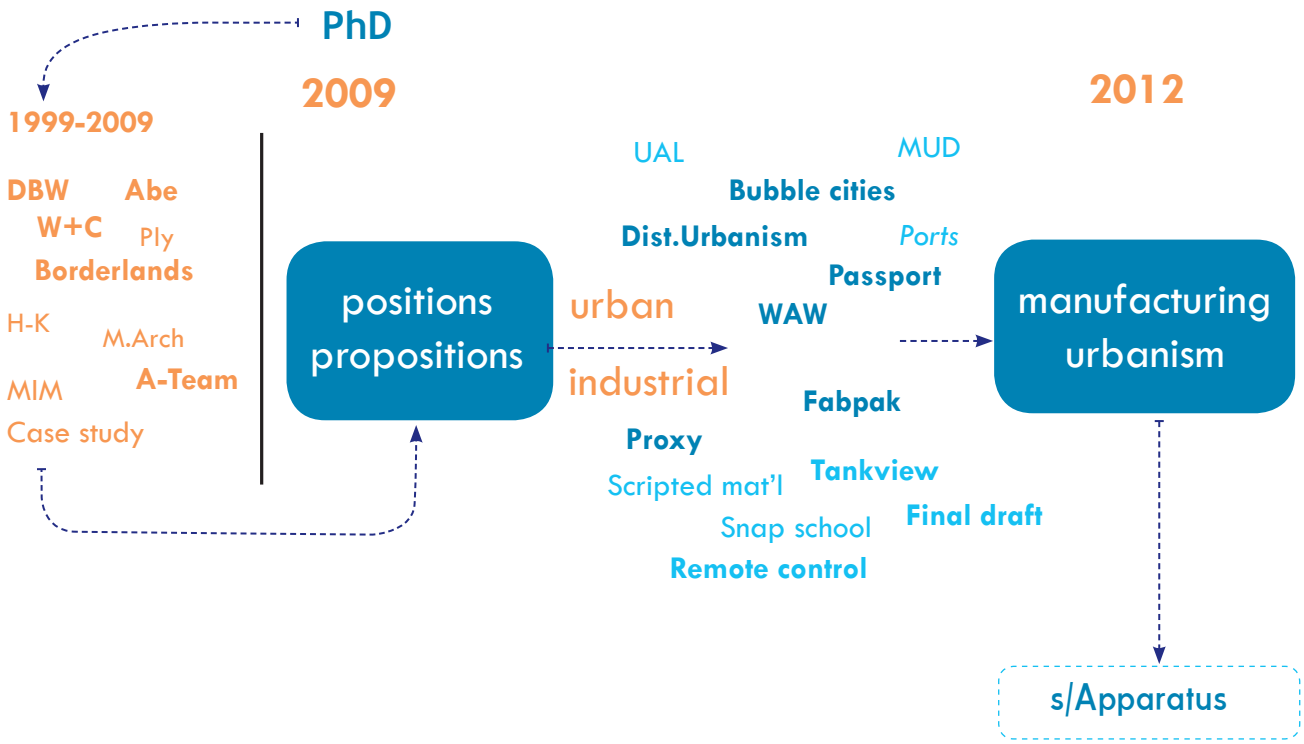
11 GLAESER, E., (2011) *Triumph of the City: How Our Greatest Invention Makes Us Richer, Smarter, Greener, Healthier, and Happier,* New York, The Penguin Press.

Form of the Document

This document charts, organises, contextualises and positions research undertaken through the PhD process. It includes: a reflection on a decade of architectural practice prior to its commencement; a collection of projects triggered from these observations; an identification of the intellectual and professional context within which the work sits – engaging with both peers and mentors historically and contemporaneously; and a proposition for future practice. The practice proposition extends this research while endeavouring to advance contemporary, practice-based architectural thinking.

This document is structured in five subsequent chapters, each establishing the boundaries of practice and reflective research, and the emerging space between. Chapter 2: ***Staging Practices***, is an introduction to the key research questions; it aims to draw links between industry and urbanism by way of key economic, technological and cultural issues. The subject of utopias and the experimental practices they enable, such as World Expo pavilions, is outlined as an example for later work. This chapter serves to frame later chapters, highlighting the drivers and interests motivating my work and introducing the broader context within which it is situated. Chapter 3: ***Urban Practices*** presents a series of case studies situated within the context of incomplete urban proposals, plans and spaces. The focus is on urbanism and urban space resulting from industrial and economic change highlighting particular cities. Chapter 4: ***Industrial Practices*** presents a series of my own design projects and studio teaching outcomes. This work investigates material practices stemming from technological or economic shifts, applied through architecture and linked to particular cities. Chapter 5: ***Networked Practices*** is the key chapter outlining the *Manufacturing Urbanism* proposal, an architectural practice that locates and materialises links between distributed urban networks and spaces, and industrial techniques. It charts the space emerging between urban and industrial practices in order to mark out a new trajectory for my own work, continuing through teaching writing and design. Chapter 6: ***Modelling a Future Practice*** outlines the practice proposal and its contribution to the field, and devises future directions for the work. A description and sketch of the proposed completion seminar exhibition to accompany this research is also included.

phd process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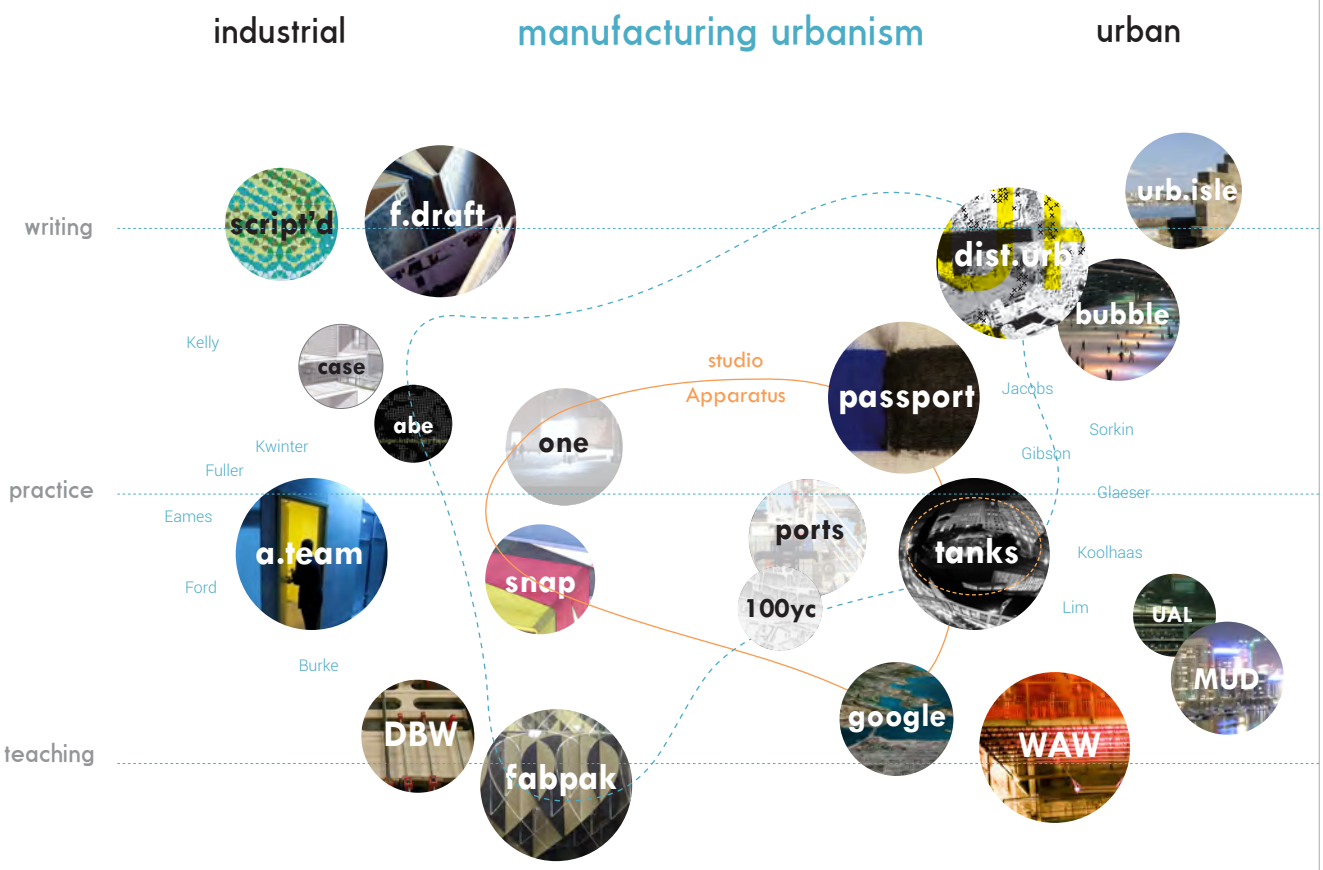

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FabPak design studios

Snap School

previous work:

Design Build Workshop

On the Spot

HOUSE: Case Study

networked projects:

Distributed Urbanism

Passport Project

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Google Cities

urban projects:

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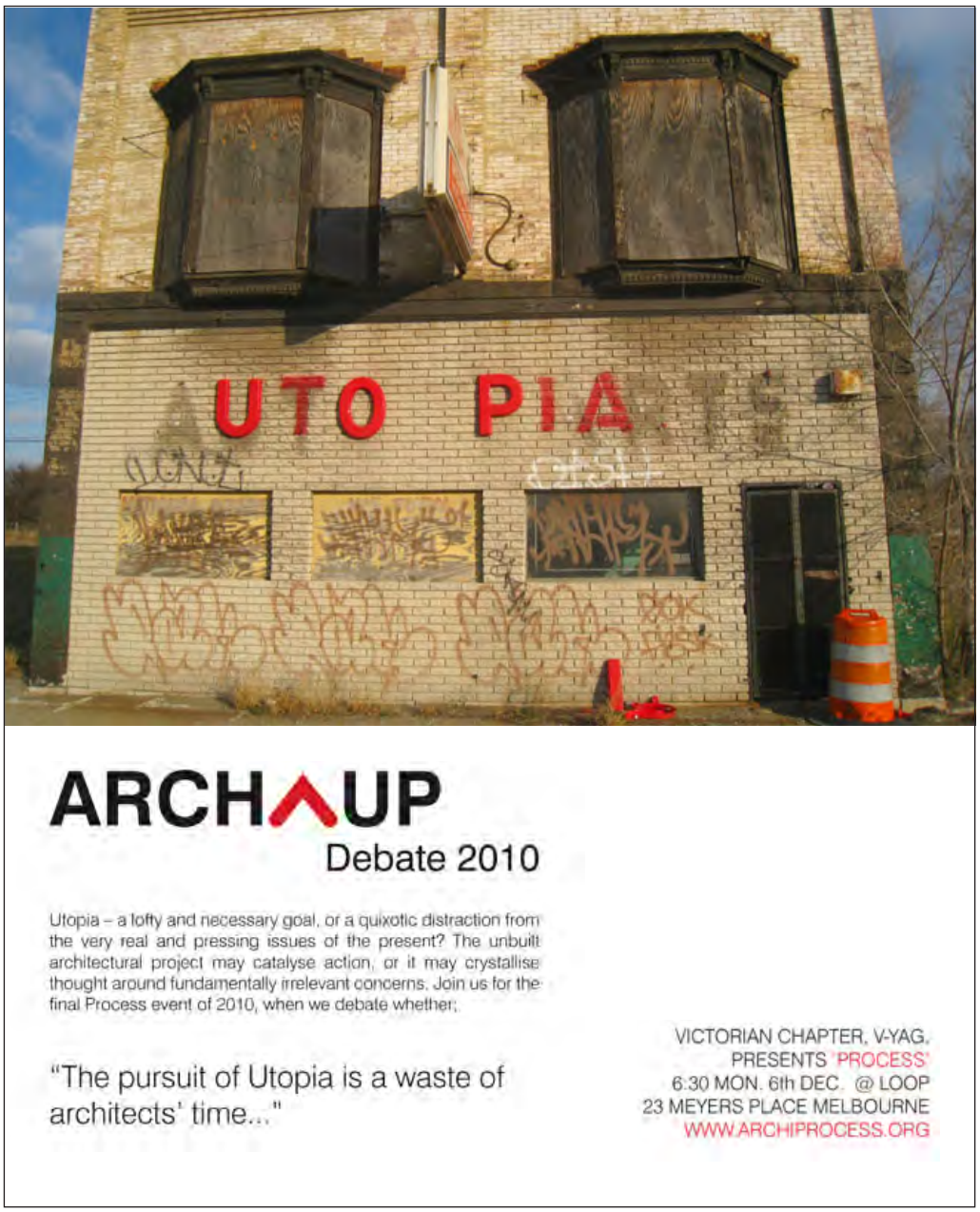


Advertisement for the Arch^Up debate (2010)

Chapter 2: Staging Practices

Between real and ideal

Overview

As a way to introduce and encapsulate many of the ideas that will be raised and explored through this body of work, a discussion of architectural utopias and the experimental practices they engender is the focus of the first chapter. This chapter establishes preliminary links between industrial and urban practices through the lens of fantastic urban schemes and extraordinarily speculative structures. As a framing chapter, it does not specifically discuss projects but intends to 'stage' the various relationships between them conceptually, historically and practically. It also serves to stage the more detailed discussion of practice-based ideas in later chapters, presented through my own work.

"Utopia is important precisely because it is not a city but a representation of one."

– Michael Sorkin (1)

Arch^Up: the pursuit of utopias

In December 2010 I was asked to be part of the annual year-end Arch^Up Debates of the monthly 'Process' event at Loop bar in Melbourne.[2] As one speaker in a team of three pitted against three, we were invited to argue the negative side of the position statement, "The pursuit of utopia is a waste of architects' time." In other words, our side was to argue for the architectural value of pursing utopias. The affirmative team lodged evidence of utopian agendas gone awry, such as ill-fated urban schemes, rampant free-market speculation and totalitarian politics. Our counterargument was posed as a question in return: If the whole point of utopias is to imagine a better world, how can that pursuit possibly be a bad thing? (And isn't that what we as architects are uniquely trained to do?) As the debate unfolded a key word in the opening statement proved critical to both sides of the argument: pursuit.

We were not, after all, debating whether utopias themselves were a waste of time but rather the value, or danger, of putting them toward any sort of practice in the first place. The notion of 'pursuit' in this case is the process through which abstract utopian ideas are translated into something tangible or real. Each team validated their position in terms of the value of this process, and in reference to real historical outcomes that have been critically judged successful or not. In choosing ill-fated modernist master-plans, for

1 SORKIN, M (2009) 'Eutopia Now!', *Harvard Design Magazine* 31, Fall/Winter 2009-10, p9.

2 PROCESS: ARCH^UP Debate (2010) "The Pursuit of Utopia is a waste of architects' time..." MORGAN, T, WILKINS, G, STAUGHTON, J JURICIVICH, J, PHILIPPS, C, ROBERTS, A, by Young Architects Group – Victorian Chapter, December 6, Loop Bar, Melbourne.

example, our opponents could demonstrate that the pursuit of utopias is fundamentally flawed – that many utopian projects are just real world versions of an idea that never lived up to the original, producing problematic results at best, socially destructive outcomes at worst. This argument defined 'pursuit' as a largely unmediated process, whereby ideas aren't so much translated as automatically, literally converted. Our position focused rather on the importance of process in its own right, arguing that future change cannot be achieved if we can't first imagine it. We therefore considered 'pursuit' in conceptual terms, in which the architecture of utopias is used to represent alternative social or environmental conditions but not equipped (or required) to provide instructions for enacting them.

"Utopian dreams in any case never entirely fade away. They are omnipresent as the hidden signifiers of our desires. Extracting them from the dark recesses of our minds and turning them into a political force for change may court the danger of the ultimate frustration of those desires."

– David Harvey (3)

The value of this debate was (for me) the way in which it enabled interrogation of the role of utopian thinking in relation to the nature of professional architectural pursuits. It raised questions about creative practice research in general, but also particularly resonated with my own thinking at the time, as clear links began to emerge between these utopian practices and those of urbanism and material production. The connection between urban and technological (or material/industrial) practices sits at the heart of many utopian schemes, and they suggest opportunities to test the future of these relationships in real time and space. World Expo buildings attempt that utopian future-as-now experiment, for example, and contribute significant advances for architectural design and thinking in the process.

In the debate of utopias it is clear that purely formal and purely conceptual outcomes, when pursued in isolation, are limited, if not inherently flawed. Challenges will always arise when trying to somehow capture or reproduce a piece of what is by definition an impossible dream world located in 'no place,' in a real place and time. However, this impossibility is also, it would appear, the very source of the power of utopian ideas. If the starting and ending point of utopia is by definition impossible, it has no logical or predictable analogue in the real world. As such it needs to be transformed somehow, (not only translated) into something else; a utopia is an index or provocation to design only, to be reincarnated in some, maybe many, other forms. Utopian schemes might provoke multiple possible manifestations of the original idea, therefore, and be produced into a variety of different outcomes, at different scales, or as events. It is only when architectural utopias are taken literally and reproduced as per the original image that they inevitably fail. As a depiction of an impossible world this is all but inevitable. Mined for ideas that may be

3 HARVEY, D. (2000) *Spaces of Hope*, Berkeley, University of California Press. p195.

approached multidimensionally, however, the value of utopian pursuits becomes clearer. The fact that they are by definition impossible makes reprocessing them a possibility; it gives license to reinterpretation as a form of translation and repeated application.

In his book *Spaces of Hope* David Harvey makes the distinction between utopias of 'spatial form' and those of 'social process'. One of the primary challenges facing both, and the reason they so often fail, he articulates, is the problem of 'closure'. Utopias of spatial form confront this directly by turning abstract (e.g. architectural) visions into concrete realities, while utopias of social processes by contrast "dangerously evade"[4] closure. The latter are predicated on perpetually open processes such as free-market exchange or social process that "have the habit of getting lost in the romanticism of endlessly open projects that never have to come to a point of closure (within space and place)."[5] He goes on to propose a form of 'socio-spatial utopianism', an attempt to ground social processes in spatial form and link the two types of utopia such that each is accountable to each other. From an architectural perspective, and within the context of this research, this discussion of closure is useful because it highlights the critical aspect of any design practice – how to translate, rather than convert, ideas into form; how to bridge the gap between real and ideal; and how to allow open-ended approaches to architectural practice.

Harvey's description of combined socio plus spatial designs for the future figures utopianism not a single point but an unfolding process of negotiation, or "long-revolution" over time.[6] If we consider this approach to process in a specifically architectural sense, it suggests an approach to architectural practice (and urbanism) wherein smaller versions of utopian schemes might be tested on the ground rather than the entire project converted into a single reality wholesale. They provide a clue to the future not the plan. They offer a provocation for a series of reality-experiments, prototypes or impermanent tests – bridges between real and ideal, now and then. As Michael Sorkin has described, "A utopian argument always includes the idea of construction, some series of human measures to bring about the "ideal" thing itself, however vaguely, provisionally or fictitiously described."[7] Proposals for that realisation, however, are not explicit, inviting multiple interpretations of the scheme in partial, incomplete or fragmentary ways. Further, because instructions for construction are open-ended and the ultimate goal is unattainable (by definition), a 'crisis' of production emerges that encourages, if not necessitates, new strategies or approaches to the question.

4 HARVEY, D. (2000) p196.

5 HARVEY, D. (2000) p174.

6 HARVEY, D. (2000) p238.

7 SORKIN, M. (2009) p7.

Futurama pavilion (1939) under construction.
(image: New York Public Library: http://exhibitions.nypl.org)

Futurama pavilion (1939) (image: http://designhistorylab.com/)

"It's always interesting, I think, to see how the future, or rather the forward-looking form of any discipline, always carries within it the seeds of its own triteness."

– William Gibson (10)

Experimenting with alternative approaches to production is at the heart of this utopian dilemma, and why utopian projects are so important. They establish an unattainable target through provocative and persuasive media, without a discernible answer being given at the level of process, or outcome. As such, they are a primary resource and instigator for innovative approaches to urbanism and material production. Questions of production are located in the contested space between real and ideal, the space that Harvey, Sorkin and so many others articulate and attempt to mediate. Harvey positions the architect as a key figure in this process, (and that of urbanisation in particular) possessor of the required skills for imagining spatial possibilities of "entirely different systems of property rights, living and working arrangements."[8] Harvey's advice on this is productively polemical, "The lesson is clear: until we insurgent architects know the courage of our minds and are prepared to take an equally speculative plunge into some unknown, we too will continue to be the objects of historical geography (like worker bees) rather than active subjects, consciously pushing human possibilities to their limits."[9] Experimental architectural practices offer insight and opportunity to take this plunge. I see the World's Fair pavilion building is one example of that attempt.

Expo: between real and ideal

Using the World's Fair as a case study on ideal utopian visions brought into practice, this section is concerned with how creative design practice might learn from utopian 'thought experiments',[11] and establish the seeds for an architectural practice predicated on prototyping and experimentation. Expo buildings are highly speculative fantasies about the future, built full scale and for public use. They are architectural manifestations of utopian thinking that are not enslaved to an image, nor do they remain solely in the conceptual world of ideas. In their design, materiality and context, the 'idea of construction' and the construction of ideas are perpetually and mutually reinforcing; they *are* ideas formed as buildings, which are in turn meant to form new ideas, and so on. Here, utopian visions are given structure, experience and audience, and are mediated by realities of present day technology and capital. As temporary project-events, they enable ambitious speculation and experimentation, while maintaining the suspension of disbelief; they are architectural playgrounds for producers and consumers alike.

8 HARVEY, D. (2000) p238.

9 HARVEY, D (2000) p255.

10 GIBSON, W. (1991) 'Text(v)oid', in *Anyone*, New York: Rizzoli International Publications, p162–63.

11 HARVEY, D. (2000) p238.

Futurama

Norman Bel Geddes's *Futurama* pavilion for General Motors at the 1939 World's Fair in New York was remarkable not only for its content – recasting the role of the automobile and its infrastructure onto the 1960s American landscape – but also for how it recast the role of the Expo pavilion building itself. Until this moment, the job of the pavilion building of the World's Fair was primarily to showcase products and how they were made, especially agriculture and manufacturing. The 1939 Fair ushered in a new era for the international exposition, which connected these advancements with culture and demonstrated how they could shape 'The World of Tomorrow.' The 1939 Futurama exhibition took this ambition one step further, not only depicting an image of what that world might look like, but creating an environment through which to 'experience' it: a simulated eighteen-minute low-flying airplane journey over American 'Highways and Horizons.' Business Week described the virtual journey like a movie: "It unfolds a prophecy of cities, towns, and countrysides served by a comprehensive road system. Somewhere in the rolling davenport a disembodied angel explains the Elysium."[12]

Combining his dual expertise in industrial and theatrical design, Geddes dramatised the proposal for a mass public and followed it up a year later with *Magic Motorways,* the publication written to take the reader 'backstage' and to discover secrets of how the exhibition proposal developed and operated.[13] He was not referring in this publication to how the automotive machinery itself worked, as previous Fair pavilions emphasised. Rather, the didactic aspect of Geddes' approach to World's Fair exhibition and publication, combined, was to present a sense of the workings of broader systems – the economic, social and technological premises and consequences of a vision, for which General Motors was the implicit enabler. A genius and seamless mix of industry, advertising, theatre and design in the form of a two-part manifesto (an exhibition followed by publication), Futurama directly influenced the 1956 Interstate Highway Act, and the American metropolis as we now know it.[14]

12 FOTSCH, P.M. (2001) 'The Building of a Superhighway Future at the New York World's Fair', in *Cultural Critique* (48): p65.

13 GEDDES, N. B. (1940) 'Highways and Horizons' in *Magic Motorways*, New York, Random House. p48.

14 FISHMAN, R. (2000) 'The American Metropolis at Century's End: Past and Future Influences' in *Housing Policy Debate* · Volume 11, Issue 1 199, Fannie Mae Foundation, Rutgers University. p200.

"The strategies and mechanisms that later shape Manhattan are tested in the laboratory of Coney Island before they finally leap toward the larger Island. Coney Island is a fetal Manhattan."

– Rem Koolhaas (15)

The 1964 follow up to Futurama, Futurama II, also in New York, was a similarly ambitious projection of technologically dominated futures, deployed at a vastly larger geographic scale. The focus shifted from the highways of the American city to the world and beyond, showcasing future life amidst even the most remote or extreme environment, yet with all possible domestic comforts. Wild settings such as the jungle, the sea, the arctic poles, the desert and even the moon were tamed and colonised by modern technology, producing new frontiers for human domination. Indeed utopias seem to always be synonymous with this sort of technological progress; they continually emphasise the ability to link people across extensive networks of time and space. Techno-futuristic utopian themes recur in Expo buildings, even though representations of their spatial form – their 'closure' to use Harvey's term – is depicted differently every time. The gap between the experimental depiction and the reality it engenders requires yet another level of translation altogether.

This point builds on the notion of 'ideas of construction' in relation to the inherent incompleteness of any utopian project. The Expo building is a manifestation of ideas related to the future, but does not an attempt to directly produce that particular future. In this manner, these projects straddle representation and reality – they are fully complete buildings but not of this world. The detail a possible experience of the future but they do not provide instructions for its realisation. Without the ability (or possibility) to realise that plan, multiple versions of the idea exist, changing over time and scale. World's Fairs, as a version or representation of utopia, yet sited geographically, implicate the future without prescribing it.

Expo effects, future practices

It is the quality of being oriented towards the present and the future that lends utopian projects such agency, untethered from the exigencies of a specific economy while indexed to a world we recognise ourselves within. This agency is of course also where risk arises. For example, the 1939 Futurama pavilion popularised the concept of interstate highways, paving the way for the American Interstate Highway Act and thereby, the rampant metropolitan sprawl the United States confronts today. The effects of Futurama are well documented, indeed the Act was criticised at the time for not living up to the vision Futurama promised.[16] It nonetheless transformed American cities completely and permanently, ranking number one on a list of the "top 10 influences on the American metropolis of the past 50 years."[17]

15 KOOLHAAS, R. (1978) 'Coney Island: The Technology of the Fantastic', in *Delirious New York: a retroactive manifesto for Manhattan*, New York: Monacelli Press, 1994. p30.

16 WEINGROSS, R. (1996) '*Federal*-Aid Highway Act of 1956: Creating the Interstate System' in *Public Roads*, U.S. Department of Transportation, Federal Highway Administration, Vol. 60 No. 1. <http://www.fhwa.dot.gov/publications/publicroads/96summer/p96su10.cfm>.

17 FISHMAN, R. (2000) p200.

In many ways the effects of utopian projects are tangible even if the projects (such as Expo buildings) are based in fantasy. If the failures are obvious, the successes are less so, mostly because successes are less visible or quantifiable. 'Succeeding' in terms of future effect is difficult to document and measure given that the 'positive' results of utopian concepts are not entirely tangible, measurable or directly applicable. The productive influence of exhibited architectural ideas on design practice, design culture and public discourse around design is ambient. It is traceable only over time, through incremental shifts and attentive research. The influence of such projects upon future realities may be almost invisible, but it is still significant. Expos are exalted avenues for experimentation rarely found elsewhere, bracketed from direct effects and offering new situations for architectural thinking. A budget provided for toward research and development of architectural design like that for World's Fairs for example, is untenable in conventional architectural and urban practice. And the range of disciplines involved in design and execution in such contexts – through direct collaboration and indirect cross-fertilisation of ideas – is potent.

Expo projects offer a laboratory for architectural design research that may go on to be applied elsewhere, by others, through a variety of outlets. Ideas are tested in the 'sandbox' of the utopian project, before migrating toward the larger realm of architectural and urban practice. These are the so-called successes of utopian projects that manifest through experimental venues such as the World's Fair. They are no less significant but far less dramatic than the spectacular failures of built ideal city projects.

World's Fair projects offer a useful introduction to this work because of the way in which they forge links between: experimental practice and prototyping; economic, technological and industrial drivers of architectural innovation; and effects on current and future urbanism. World's Fairs are a microcosm of possibilities for practice, and are a way of considering connections between highly speculative and highly practical design research. They do so in public view and through public assessment, and through multidisciplinary forms of collaborative practice and research. They also reverse or temporarily circumvent the conventional process of architectural design and construction, in this case testing the idea through the construction itself first and then arguing (and documenting) the results and impacts after the fact. The case is made demonstrably rather than analytically or though text. It is this approach to practice that has demonstrated strong agency for urban-based projects and which will be further discussed in this research.

Utopian expo projects also enable a way to consider the agency of incompleteness, joining extreme fiction to exacting fact with an understanding that the outcome is never the only or final solution. They begin to suggest a structure of practice that maintains openness while simultaneously achieving 'closure,' to proliferate the space of the gap rather than try to fill it. This is a form of practice that resists completion rather than seeks it, producing creative works that prompt the next phase if not directly fostering further stages of development. It is a form of practice that prioritises incompleteness, identifying spaces, processes or strategies that are not or cannot be finalised, with the aim of maintaining the inherent sense of potential and possibility that comes with unfinished creative works.

The value of incompleteness, exemplified here by way of utopian outcomes embedded within World Expo buildings, has served to trigger new structural orientations towards my past and future work. World's Fairs occupy a middle ground between manufacturing, technology, architecture and urbanism, between present and future tense, and between permanent and temporary construction. They serve as a precedent for design, construction and practice at alternate durations, investment or scales.

IMAGES (left)
the history of the future, Expo buildings through time

MVRDV: Dutch pavilion, Hannover (2000)
(image: http://cabinetmagazine.org)

MVRDV: Dutch pavilion, Hannover (2000)
(image: http://www.mvrdv.nl)

MVRDV: Dutch pavilion, Hannover (2004)
(image: http://www.ivarhagendoorn.com)

MVRDV: Dutch pavilion, Hannover (2012) by Ives Maes: The Future of Yesterday
(image: http://www.nelson-atkins.org)

General Motors pavilion, New York World's Fair, 1964
(image: http://nywf64.com)

General Motors Pavilion, from the New York World's Fair, 1964 (taken in 2005)

Detroit: Woodward Avenue (2007)

Chapter 3: Urban Practices

Between industrial and economic change

"Once there was a city, divided in two parts. One part became the Good Half, the other part the Bad Half. The inhabitants of the Bad Half began to flock to the good part of the divided city, rapidly swelling into an urban exodus"

– Rem Koolhaas (1)

Overview

Cities change incrementally, unevenly, and constantly. At specific moments however, acute and dramatic transformation is evident, especially in stages of frenzied construction or rapid de-urbanisation. The aftermath of such change is often characterised by incomplete projects, unrealised agendas and general uncertainty about the next phase or direction of urbanisation. These in-between phases of a city's development, even if temporarily incapacitated, instigate new considerations for architectural practice, especially in terms of its role in urbanisation and relationship to the mechanisms which alter, (re)organise and (re)envision the city. This chapter introduces a context for thinking about these approaches both historically and through a discussion of specific urban practices within transforming (shrinking or expanding) cities. Detroit, Tokyo and Dubai are discussed in detail with regard to specific spatial and architectural conditions, and are compared to each other. A series of photographs illustrate this comparison spatially.

Introduction

Cities consist of many cities. Not only in the mirco-urban, 'city of villages' manner, but as multiple cities overlapping coincidentally in time and space. We recognize the city we engage with, but many other versions exist simultaneously. Calvino's *Invisible Cities* is an example, or China Miéville's science fiction novel *The City & the City.* Both novels depict the many, multilayered and multidimensional worlds within any one city, but Miéville's narrative exposes the economic and socio-political systems that reinforce boundaries within his double-city, including laws around citizenship and strict punishments for so much as 'seeing' the 'other' city (which is physically one and the same as one's own). As a piece of fiction, Miéville's novel provokes quite imaginative spatial and social relationships between cities and their inhabitants. Taken more realistically, however, *The City & the City* begins to elucidate, through exaggeration, the mechanisms, policies and informal systems by which the multiple boundaries within a city are constructed and perpetually reconstructed. These include physical boundaries, such as buildings, landscape and infrastructure, but also invisible boundaries, such as economic, regulatory, social and perceptual boundaries. The 'twin cities' portrayed in Miéville's novel can be found in any real city.

1 KOOLHAAS, R. (1995) Exodus, of the Voluntary Prisoners of Architecture', in *SMLXL: Office for Metropolitan Architecture*, R. Koolhaas, and B. Mau, eds. New York, Monacelli Press. p2.

The first section of this chapter uncovers the mechanisms through which cities and their 'twins' exist, highlighting the types of boundaries governing spaces within and between them, and how architectural practices operate in response. There are of course more than two versions of any one city, but the notion of twins is useful here as a way to consider the specific conditions and opportunities that arise between two versions of a city, especially between phases or states of change. The twinned structure also relates back to the larger framework of this PhD, exploring two conditions in relation to each other – such as industrial and urban transformation, or utopian and pragmatic approaches – in order to surface and explore the territory between them. In particular this chapter highlights the notion of twin cities to illustrate a space of practice between fixed and unfixed spatial boundaries that emerge as a result of rapid urban transformation.

The investigation of virtual and physical boundaries that delimit cities (within cities) traverses much of my work. The *Borderlands* international architecture workshop and symposium, for example, focused on analysing, categorising and reorganising urban boundary conditions in order to reveal new potential sites, projects or even communities for future work. This event established the framework for the publication *Distributed Urbanism: Cities After Google Earth,* and the *Google Cities* design studio coursework at RMIT that followed (discussed in Chapter 5). Another version of the 'double city' relates to distinct phases of development or changes in urban fabric or use. For example, the fluid boundaries between formal and informal economies in Tsukiji Market in Tokyo, or relationships between politically and economically incentivised spaces in Detroit, (e.g. Empowerment zones) or the provisional boundaries and territories that emerge in the wake of crisis, such as the temporary occupations that followed the 2009 Victorian bush fires and Great Eastern Earthquake and Tsunami in Japan. Collectively, this research endeavours to uncover the unseen cities within those more standardly available or immediately present, in order to rethink architecture's agency to interact with them.

"The course was concerned to help a Besz citizen through the potentially traumatic fact of actually being in Ul Qoma, unseeing all their familiar environs... and seeing the buildings beside us that we had spent decades making sure not to notice."

– China Miéville (2)

Three case studies are developed to that end, focused on Detroit, Tokyo and Dubai, with a framing essay introducing them. The essay proposes an approach to urbanism in the midst of change, focused on the relationship between economic and industrial change in cities.

2 MIÉVILLE, C. (2009) *The City & the City*, New York, Del Rey, Ballantine Books. p133.

Becoming Unfinished

The cities and sites presented here are either enduring or enjoying the effects of massive economic shifts, often in connection to the way things are physically produced or manufactured. Post-industrial sites, unfinished developments and the under-regulated zones that emerge through rapid or severe economic shifts offer much potential for design, partly because there is more obvious need acknowledged for it, and also because there is much less resistance facing change. These sites exist between the present and the future in a distinctly palpable and unique way, caught between what they are, once were and what they were once expected to become. As Gibson has suggested:

> *Cities in the world that have been great cities in my lifetime have gone through legendary phases in which they offer cheap ground level retail space and cheap live-work space for young artists. New York had it aplenty, London had it aplenty. They no longer have it in the same way. They've become sort of 'cooked', and once a city is completely cooked, it's more like Paris, where the city's business is not to change; but it's not a place that actually welcomes innovation.*[4]

"There are two different kinds of cities: one is a kind of city or kind of neighbourhood where you can weld on the sidewalk and no one will stop you, and the other cities you can't weld on the sidewalk."

– William Gibson (3)

However, in a typical course of urbanisation, predicated on continual growth, liminal or marginal spaces become absorbed into higher valued space as the need for housing, commercial and retail space grows. Unregulated spaces are colonised first by fringe or unsanctioned activities, while higher-end retail and residential development soon follow. In this manner cities naturally progress from 'uncooked' to cooked, from an abundance of inexpensive space to an abundance of relatively expensive space with more predictable (and profitable) uses on them. With this shift comes increased control over programming, zoning, architectural design and so on, all in service of continued economic growth and profit. This pattern is not unique to cities however, restrictive covenants in many housing subdivisions are a suburban example of stringent design and planning regulations in service of economic stability or growth.

This persistent, economically-driven form of urban progression, however, isn't always a continuous or linear one, nor is it the only direction in which cities change. Even mature or stable cities can grow to become 'unfinished' as a result of severe economic, industrial or environmental shifts. Cities can move from a state of mature, highly developed urbanism to a condition where under-zoned, under-regulated spaces exist centrally; or from 'cooked' to 'uncooked' in Gibson's terms. Detroit is a clear example of this. Its 300-year history reflects a shift from burgeoning industry and culture to depopulation and decline, and a more recent shift towards small-scale manufacturing and digital media. Poised now

3 GIBSON, W. (2012) 'William Gibson in Real Life,' interview with Alex Pasternak, on *Motherboard-TV*, April 4, Paris. <http://motherboard.vice.com/2012/4/4/motherboard-tv-william-gibson-in-real-life>.

4 GIBSON, W. (2012)

between the bleakest low point and an uncertain but palpably emerging future, Detroit is an example of a city that is simultaneously very well established and yet precariously unfinished. There is no lack of cheap ground level retail space and (consequently) much opportunity for innovative industry and urbanism.

The severity of Detroit's depopulation also, ironically, made it more popular; it attracts ever-increasing amounts of attention from architects and urbanists, as well as the music, fashion, film and photography industries. This attention is partially scavenger-like 'ruin porn,'[5] but is also a result of newfound sense of accessibility to the city itself (physically, economically and culturally) as well as to the mechanisms governing it. The typical regulatory strictures and authorities no longer apply, at least not in the same way they once did, and so new design opportunities can unfold in any number of ways and with an abundance of space to do so. Lingering between states of post-industrial urbanism and whatever is to come next, there is much to do in Detroit and no sanctioned way to do it. This presents seemingly unlimited opportunities for innovation and experimentation unlike that of more well-formed, or 'cooked' metropolitan centres. It also raises important questions about patterns of urban growth elsewhere. Is there a way to maintain the productive qualities of under-cooked (or rather de-cooked) cities in other places that are growing or mature? In other words, can the benefits of growth and benefits of decline coexist, strategically?

"The state of incompleteness must always be in the making and is a vital evolving element that allows for continuous unforeseen changes and unplanned growth.

– William Lim (6)

Proposition: two-way street

If the progression of urban development has demonstrated that it can move in two directions, from nascent to mature and from inexpensive to exclusive, and in reverse, might it also be possible for cities to remain perpetually 'uncooked' as far as accessibility to space, opportunity for alternative programming and low cost are concerned? Economic growth tends to foster the former, pushing these opportunities ever farther from the centre of the city. Economic recession, on the other hand, opens those coveted inner spaces up once again. Given the example of Detroit and many similarly conditioned 'shrinking cities,'[7] it is clear that continual progression is never fully predictable, nor is the socioeconomic and programmatic exclusivity that comes that 'progression' universally desirable. How might cities remain 'unfinished' even as they mature? How might they strive towards completeness and incompleteness simultaneously, given that both momentums have recognisable benefits, economically, architecturally, culturally and in terms of productivity?

5 LEARY, J. P. (2011) 'Detroitism' on Guernica, January 15, 2011. viewed 8 August 2012 <http://www.guernicamag.com/features/leary_1_15_11/>

6 LIM, W.S.W. (2012) *Incomplete Urbanism: A Critical Urban Strategy for Emerging Economies*, Singapore, World Scientific Publishers, p63.

7 OSWALT, P. ed. (2001) *Shrinking Cities*: *International Research* (volume 1) and *Interventions* (volume 2), Ostfildern, Hatje Cantz Verlag.

If unfinished cities engender innovation by nature, it might also be said that cities that engender innovation are unfinished. Mature cities might remain 'uncooked' provided they find ways to resist the negative or exclusionary spatial and programmatic effects of growth – while it's happening. This approach moves towards the type of urban tactical projects which aim to instigating growth in the face of decline. Here however, the proposition works in the other direction – to seed economic and regulatory resistance to the momentum of growth. 'Seed'-type projects (tactical and potent, unofficial or ad hoc) offer a useful approach to such an agenda, as examples from both Melbourne and Detroit demonstrate. Melbourne's Postcode 3000 initiative (1992), and Liquor Reform Act (1998) triggered a transformation the central business district from a daytime-only business district to a twenty-four hour cultural and residential 'village', and from a flat social and economic area to a multidimensional one. Detroit, albeit coming from a much more extreme position in terms of population and economic decline, has similarly seeded numerous projects over the past decade to instigate urban growth in the face of decline. These are not comprehensive plans or master-planning projects but are instead small, tactical manoeuvres that produce a local spike in an otherwise flat or depressed urbanism.[8] It seems possible then, that similar strategies might be developed to seed openness and economic accessibility into an otherwise very tightly bound economic-urban development formula.

The practice proposed in through this PhD seeks to develop strategies that operate against the grain of development in whichever direction such development proceeds at the time (whether growth or decline). It is not intended as an inherently subversive agenda, or even an overtly political one, although strongly embedded in political and economic systems of development. The ambition is predicated firstly on an attempt to keep cities as 'unfinished' as possible for as long as possible for the benefits of alternative use and industry. That is, to encourage diverse architectural practices and qualities of urbanism ongoing, despite strong momentum upwards (or downwards). In the case of growing cities, the aim is for wide accessibility to central urban space, increase in under-regulated sites, variation in parcel size, and alternative organisations of ownership, for example. In the case of declining cities, the aim is for targeted seed projects to counter the otherwise rampant blight and depopulation. In either case the goal is to produce and maintain tension between dissimilar patterns and uses in urban development. This is the kind of urban space of innovation that Gibson's quote seems to be in search of.

8 Notable projects include economic initiatives towards increased home-ownership, urban agricultural initiatives such as the Greening of Detroit organization, neighborhood cooperatives such as the Mexicantown Community Development Corporation, or activist community design projects by the Dan Pitera of the Detroit Collaborative Design Center (DCDC).

Trojan Horse: between cause and effect

Unfinished urbanism is posed here as an agenda rather than a description of a quality of space. That is, cities should strive to remain unfinished, and to do so in central districts, not just the urban peripheries. The momentum of growth in any major city would suggest that this is impossible, but is it? How might architecture and urbanism embody incompleteness, even if their city is already 'cooked'?

The paradox may be resolved through the mechanisms of planning, if unofficially so, and especially through strategies that resist full economic, architectural or infrastructural cohesion. One focus, for example, is regulatory codes, which are cheaper and easier to change than physical or social structures, and with potentially much greater collective impact. Practices of prototyping, incentivising property and plot ratios or temporary constructions also work toward greater diversity in the use and value of urban space. They act as small gestures toward greater change, or a way to enable more ambitious agendas through more modest, or immediate ones. Examples of this agenda in practice include Dan Hill's work with the Helsinki Design Lab at SITRA. Their Low2No project constructed a prototype for timber-frame construction that satisfied the immediate demands of this individual project brief but was also positioned strategically to affect change in building regulations and revive the fledgling timber industry locally.[9] Another example is William Lim, who in his book *Incomplete Urbanism* outlines a proposal to incentivise builders towards creative and diverse developments through the economic negotiation and exchange of plot ratios. This offers a counterproposal to the conventional development patterns of rapidly growing Asian cities.

> *Within each zone, projects are given flexibility to substantially exceed the permissible plot ratio, provided developers must purchase extra plot ratio from the authorities. When buildings are preserved for the interest of the community or when owners decide to keep their existing buildings, money collected from the payment for extra plot ratio can be allocated to building owners for upgrading. This mechanism will retain the old and the historically significant buildings. It will prevent harmful and avoidable demolition as well as provide facilities for new and experimental. In the process, adjoining buildings can co-exist in a complex, exciting and chaotic order.*[10]

Another example of creative efforts towards maintaining unfinished qualities of cities through the mechanisms of planning is Hou Hanru's discussion of 'post-planning,' which articulates how the mechanisms of planning might continue to occur after the city is fully constructed.

9 HILL, D. (2010) Helsinki Design Lab by Sitra, HDL, viewed 19 March 2011, <http://www.helsinkidesignlab.org/pages/about>.

10 LIM, W. S. W. (2012) p64.

> *Cities are collages of zones of urgency. Cities can only be planned by means of continuous and incessant operations of re-planning. Construction and modification of urban structures are always ahead of the plans. Urban realities are always posterior events. They are results of delayed and deferred plans. Planning is actually post-planning.*[11]

Hanru's proposal acknowledges the fact that the frenetic pace of urbanisation in some parts of the world means that construction outpaces planning. Development explodes to meet demand and the implications at broader strategic, smaller pedestrian or environmental levels are not thoroughly considered in advance. Post-planning works in the face of this new, completed reality rather than predetermining it (or encumbering the process in advance), allowing another layer of urbanisation to occur once the primary development is complete. Post-planning projects are often small infrastructural additions or deletions that work to great effect.[12] They are a way to make adjustments after the fact, to correct a system that is already fully established, and thereby provide a release valve to tightly bound development decisions fuelled by the momentum of growth and demand.

This is an inherently optimistic and empowering proposition, especially in the face of rampant growth or decline, both of which seem to build a momentum all their own and engender a sense of powerlessness about possibilities for smaller change or intervention. David Harvey discusses this in relation to utopias, using Baltimore as example of a city that is overwhelmed by myriad challenges, and which begins to feel like a lost cause for change. (like Detroit, Baltimore experienced a crisis of manufacturing and de-population). Imaginary, utopian schemes in this context are offered as hope for a path out of that morass. The paradigms of post-planning offer another path, and a more immediately applicable and cooperative one. If the Expo building is a way to test utopian ideas on the ground experimentally, post-planning interventions are a way to make adjustments to the city in the wake of massive, seemingly uncontrollable urbanisation – whether upward or downward. Hanru's examples are focused on the rampant growth of Asian cities, but the paradigm might just as productively be employed in service of the opposite of momentum. Indeed it might be translated and applied to a variety of situations in the wake of severe change, such as post-bubble conditions, or as an antidote to deindustrialisation or depopulation.

These approaches seem most attractive when they are the most necessary, such as in an economic recession or boom; however their longer-term effects are where their real value lies. Experimental constructions (for example, by SITRA) and post-planning projects share an agenda toward action and away from analysis, by enacting the process of building for

11 HANRU, H. (2012) 'Excessive, Dense, Speedy, Complex, Empty But Humane: Contemporary Creative Activities (digitally) Facing the Post-planning Urban world' Presented at the *Contested Commons* Conference, viewed 2012. <http://mail.sarai.net/pipermail/urbanstudygroup/2005-January/001770.html>.

12 LIM, W. S. W. (2012) p34.

regulatory change rather than the other way around. In this manner they demonstrate the effects of alternative architectural approaches rather than simply describing, analysing or proposing them. This may be the most effective way to enact change in the midst of overwhelming momentum otherwise: to resist exclusivity (and stagnancy) during growth or to seed activity (and innovation) during a decline. Of course the pressures in either case are quite different, but the value is in the agency of action. In the face of seemingly unremitting change – toward or away from urbanisation – active, material approaches to practice resonate in ways that may not be know at the outset. Regardless of the immediate benefit or function, in this way they have the potential to act as Trojan horses: smuggling in greater, longer-term change through seemingly insignificant, ulterior, or provisional types of work.

"Perhaps, rather than assuming stability and explaining change, one needs to assume change and explain stability. Elastic planning strategies are needed to facilitate surfing the highly unstable and unpredictable evolution of the contemporary city without, at the same time, merely accommodating this evolution. It is precisely this question – how to provide sufficient looseness with regard to future scenarios – that constitutes the principal paradox of urban development today. Overcoming this paradox hinges on learning the ability to operate at the cusp between control and disorganization."

– Roger Sherman (13)

Case Studies: urbanism between economies

The following section elaborates on the above arguments of this chapter through case studies of three cities in the midst of change. Each case study is presented in two parts: as a narrative essay and as a photo essay capturing the qualities of urban space there. Each tells a story of a site or urban condition poised between what it was and what it is yet to become, highlighting the architectural opportunities and challenges posed within that city's indeterminate and unfinished spaces.

Detroit

Tokyo

Dubai

13 SHERMAN, R. (2005) 'If-Then', in R. Somol and S. Whiting eds., *Log 5*, New York, Anyone Corporation, p51.

World Architecture Workshop: *Borderlands*.
Final party at the Russell Industrial Center, 2007.

1. Detroit

"Forget what you think you know about this place. Detroit is the most relevant city in the United States for the simple reason that it is the most unequivocally modern and therefore distinctive of our national culture: in other words, a total success."

– Jerry Herron (14)

The post-industrial condition of Detroit has become well known, and a constant reference point for planners and architects in the past decade. Jerry Herron's quote introduces the multiple ironies engendered by its iconic transformation, a metonym for deindustrialisation and decline.[15] The famous 'modern' city lost half of its population in fifty years, being founded upon, supported by and then abandoned because of the automobile industry. In exact figures, from 1910 to 1950 Detroit's population surged from 285,000 people to over 1.8 million, over six times its size in fifty years. Currently the population is approximately 770,000 people. During the same period in time, the population of Detroit's home state of Michigan has in fact risen, as has the per capita income, a fact that emphasises the deep disparities at play. The per capita income in Detroit is currently $14,213 and the median household value is $67,000. Only one block away, in the leafy suburb of Grosse Pointe, the per capita income is $54,865 and median household value is $258,734.[16] Another forty kilometres away is Bloomfield Hills, (home to Cranbrook Academy), which consistently ranks as the second richest city in the United States.

The disparities of Detroit are complex and deeply historical, but it is well understood that the economic monoculture of the automobile industry can account for most of the extreme shifts. The city could not mediate change through other industries, and never accumulated the social diversity that comes with industry diversity. The result of these changes has left the organisational structure of Detroit in a perpetual state of reconfiguration. Decades of depopulation away from the city centre combined with continual growth in the surrounding suburbs, has produced a city of sharp economic and social contrasts. Detroit has tens of thousands of vacant lots and structures, and a decidedly elusive spatial character as a result. As residents migrate outward, space within the city is continually re-territorialised through processes of abandonment, appropriation, development or reclamation. Yet as the city simultaneously shrinks (in terms of population) and expands (more open space), it does not do so evenly. Rather, strange and incongruous urban patterns result: small discrete parcels mutate into large, vague tracts; cohesive blocks disintegrate into island-buildings, and landscape becomes the dominant form of urbanisation.[17] The borders that once existed between architecture and landscape or city and citizen, for example, are increasingly challenged, erased or redefined. Just as the space of Detroit is itself perpetually reconfigured, the form of urbanism taking place there is about architectural resiliency at operating "at the cusp between control and disorganization."[18]

14 HERRON, J. 'Three meditations on the Ruins of Detroit', in Stalking Detroit, G. Daskalakis, C. Waldheim, J. Young, eds, Barcelona, Actar, p33.

15 LEARY, J.P. (2011)

16 United States Census Bureau of Statistics 2006, Statistical figures, U.S. Department of Commerce, United States, Accessed 4 July 2010. <http://www.census.gov/>.

17 WALDHEIM, C. (2001) 'Decamping Detroit' in *Stalking Detroit*, G. Daskalakis, C. Waldheim, J. Young, eds, Barcelona, Actar, p110. (refers to the term landscape urbanism as defined by Charles Waldheim's Landscape Urbanism conference in 1997)

18 SHERMAN, R. (2005) p51.

Michigan Central Train Station (2007)

Industrial buildings in southwest Detroit (2007)

Zooming into some key sites and significant architectural examples helps to unravel, or at least illustrate, the spatial complexities of the city. Detroit is complex not in the sense of a dizzying cacophony of physically dense cities like Tokyo or New York, but for the almost indescribable "density of emptiness" that it possesses.'[19] For example, on a two-square kilometre site only one kilometre from the downtown centre some of the most impossibly contested relationships between the physical, economic, political and private boundaries occur. This was the site of the *Borderlands* workshop and research, bound on the east by the tree-lined Rosa Parks Boulevard, on the west by Detroit's historical city limit, on the south by the Detroit River and on the north by an interstate highway – a primary artery linking automobile manufacturing to Canada and other international markets. This site includes both active and obsolete industrial facilities, new low-density suburban housing, abandoned railway infrastructure and an international border crossing. It also includes Mexicantown, one of the few neighbourhoods experiencing population growth within the city. Filling in the gaps between pockets of development are large expanses of abandoned property, under-utilised infrastructure, and more than a few of the nearly 20,000 stray dogs that live in Detroit.

Key landmarks include the Ambassador Bridge, the *privately owned* international border crossing and busiest commercial link between the US and Canada. This bridge single-handedly manages and controls the intricately orchestrated, just-in-time logistics between manufacturing industries in Detroit and Windsor, Ontario. It is owned by a Detroit resident, Manuel ("Matty") Moroun, owner of the Detroit International Bridge Company. He also owns the famous (and famously abandoned) Michigan Central Station, in this same area. Designed in the manner of New York's Central Station, and by the same architect, the station sits as an eerie monument to the former Detroit and to unfinished urbanism more broadly. The historic landmark of St Anne's Church is nearby, as is the former Tiger's Stadium, built in 1912, replaced by Comerica Park in 2000 and demolished in 2009. A bit further up the river is the Renaissance Center, a John Portman designed seven-linked tower complex initiated by Henry Ford II as a way to revitalise Detroit's economy in the 1970s, and later purchased by General Motors. These landmarks were once knitted into Detroit's dense urban fabric, but now sit in relation to a very different spatial organisation surrounding them; as building fragments within the 'density of emptiness' produced by perpetual phases of construction and destruction.

19 YOUNG, J. (2010) 'Density of Emptiness', in *Distributed Urbanism: Cities after Google Earth*, Abingdon, Routledge.

Construction and destruction both indicate 'urban renaissance' in Detroit. Construction of the new Tiger's stadium (Comerica Park) and Ford Field entertainment complex promised a rebirth for the vacant downtown core in the same way that demolishing the famous Hudson's building did. The demolition of Hudson's was well publicised and celebrated, with Detroit Mayor Dennis Archer ceremoniously detonating nearly twelve hundred kilos of explosives fixed inside the building. Founded in 1881, Hudson's was a retail institution for over a century and became the cultural icon for Detroit that Macy's was for New York. A second Hudson's branch was built in 1954 at Victor Gruen's famous Northland Center, the first open-air shopping mall and future prototype for suburban development everywhere. Drained of its original, urban customer base however, the original downtown store closed in 1983 and became an ironic symbol of renewal when it was demolished in 1998.

The story of Detroit as a centre of automobile industry fervour and then post-industrial reinvention, and its move from an urbane commercial centre to evacuated urban ecology (and so on) epitomises a pattern of perpetual transformation and urban reconfiguration wrought upon post-industrial cities over time. To narrate these stories of cities as a culmination of iconic buildings, key personalities of industrial modernism, and in the context of much broader socio-economic patterns that have swept through, is to recognise the patterns and forces which link invisible and tangible urban boundaries. In Detroit's case they have reorganised the boundaries and fragmented the fabric into a series of localised, distributed sites, each with a new and particular urban character and influence of its own. These patterns initially formed around the industry upon which the city was built. That industry produced the cars, the factories and the city around it, and set in motion a pattern of perpetual reconfiguration unlike anywhere else in the world.

Towards envisioning possible plans and futures for Detroit away from, but informed by, its current state of post-industrial depopulation and seed-like experimentation, some examples are useful to consider. Hanru's post-planning, even if developed for rapidly urbanising Asian cities, seems especially useful here. It focuses on what can be done rather than succumbing to the overwhelming momentum otherwise directed. Harvey's socio-temporal utopian strategies are another effective option for a place like Detroit, for all the same reasons he would recommend them for Baltimore. William Lim's incentivised plot ratios are perhaps less immediately applicable, but nonetheless offer creative strategies for the accumulation and distribution of land. There is already a history of this type of incentive in Detroit in fact, where buildings and lots were once available for $1 with the stipulation of development within one year. Interboro Partners' "blotting"

strategies proposed for the *Shrinking Cities* research are a more recent example, whereby vacant lots accumulated by homeowners produced new residential configurations from the original urban parcel patterns. A block of lots becomes a blot, and so the city can be creatively 'blotted'.[20] These are all possible strategies to creatively reconfigure the existing conditions and currently very flexible boundaries that delimit space in Detroit.

Detroit today is in a state of metamorphosis, re-tooling its economy from industry to entertainment, re-branding its image from the Motor City to one based around culture and technology, and refocusing development from the commercial downtown centre to multiple, distributed sites across the broader city limits. The multiplicity of border conditions which regulate land, including international, national, state and city jurisdiction, sometimes all on one lot, preclude the possibility or relevance of a single all-encompassing plan. Insofar as the original city is a manifestation of the forms of production that it was founded upon, the future forms of production will inevitably produce new urban patterns. Accordingly, as industrial production has been replaced by the service industry and an increasing number of high-tech companies relocate to Detroit, so will new types of urban space and architecture around them.

20 INTERBORO PARTNERS (2008) 'Improve Your Lot' in *VERB: Crisis*, Barcelona, Actar.

Advertisement for the *Borderlands* World Architecture Workshop (2007)

Figure-ground maps of Detroit (1998)

Detroit people mover (2007)

Hotel Yorba (2007)

'fragmented' buildings in Detroit (2007)

GAR building (above); view of Ambassador Bridge (below)

Detroit ‘borderlands’ (2007)

Detroit ‘borderlands’ (2007)

Tsukiji Fish Market (2007)

2. Tokyo: unfinished cities

Tokyo is currently the largest and most expensive city in the world, but in 100 years it may have more in common with Detroit than it does with Seoul (the second largest). Population decline in Japan is well documented. Estimates suggest a decrease by half in the next century, if not two-thirds.[21] More radical research has even predicted that no children will be left in Japan at all by the year 3012 due to the declining birth rate.[22] So far, populations from smaller cities have migrated to larger ones, keeping cities like Tokyo growing while smaller cities shrink. However, it appears this trend may have reached a plateau; from now on even the population of Tokyo is projected to continue to shrink alongside the national trend.

A comparison, therefore, between Tokyo and Detroit is tempting. Detroit lost more than half of its population in fifty years, while Tokyo (if it follows the national trend) will lose more than half of its population in the next 100 years. However, Detroit confronts the issue of a shrinking population in the context of state and national population increases, and alongside radical shifts in industry from manufacturing to service and now emerging high-tech. Tokyo on the other hand, is confronting the issue of how to (re)produce its own existing population, a radically different problem altogether. In either case it is difficult if not impossible to suggest how exactly these issues will affect Detroit's and Tokyo's future, especially as relationships between industry and design continue to change. Nevertheless, even a cursory comparison highlights the perpetual transformation of not only cities but major metropolitan centres, and not always toward growth. Tokyo is a global centre of commerce, culture and technology. Detroit too, was once the centre of manufacturing for the world, and ranked in the top five most populous cities in the United States at that time. Both cities will change (or already have) radically and relatively rapidly, despite the fact that they were at one point both equally 'cooked.'

Despite the overwhelming tendencies to plan for perpetual growth, growth is not always the case, or perhaps growth and decline coexist in a more complex way. The effects and opportunities of such transformations in both directions is the subject of this work, especially in considering the residual spatial effects and alternative architectural practices that such trajectories offer up to, if not demand, from architects and urban designers.

21 Department of Population Dynamics Research (2002) 'Population Projections for Japan: 2001-2050,' Published by National Institute of Population and Social Security Research.

22 HIROSHI, Y., MASAHIRO, I., (2012) 'World Clock of Child Population in Japan', Mail Research Group, Graduate School of Economics and Management, Tohoku University, viewed 1 August 2012 <http://mega.econ.tohoku.ac.jp/Children/index_en.jsp>.

Tsukiji

Zooming into particular sites in Tokyo serves to evidence these dramatic shifts and the architectural practices they enable. One site that has been a particular focus of this research is Tsukiji Market in Tokyo. Tsukiji Market occupies fifty-six acres of reclaimed land in Tokyo. It is the largest market of its kind, handling almost all seafood consumed in Tokyo. Marine life of all forms and from all over the globe establishes the link between fishers, distributors, government officials, wholesalers, merchants, restaurants, consumers and tourists. The market, as an urban space and as an economic system, sits at the intersection of vast social, economic and institutional exchanges. In this context the Market operates as a sort of city-within-the-city, especially given the eclectic mix of 'programs' contained there, including a temple, bank, post offices, barber shop, pharmacy, library, medical clinic, coffee shops, offices, a hotel, etc. However, unlike more recent local versions of these city-within-the-city (mega)developments, such as Shiodome, Tokyo Midtown or Roppongi Hills, the micro-urbanism of Tsukiji is flexible and reconfigurable. Again a comparison between Tokyo and Detroit is useful despite obvious differences; there are interesting lessons to be learnt from Tsukiji in terms of achieving flexibility within highly engrained, complex and permanent architectural, economic and urban fixtures.

Tsukiji is first and foremost a market, but it is also a site of production. As a factory complex it effectively operates 'inside out': internal production seamlessly interacts and integrates with the city around it. Organisationally, production takes place at the river's edge with the public facade is along the main street, and in between is a tightly orchestrated but visually chaotic mix of activities and exchanges. The spatial organisation is perfectly aligned with the micro-commodity chain streaming through the market: auction pits for producers and suppliers are located near the water's edge; wholesaler stalls are located in the adjacent central building; distribution sheds and loading docks are adjacent to wholesalers; and a series of outer-market buildings containing retail suppliers and small restaurants connect the market to the rest of the city physically and commercially. As such, the complex is organised in order to streamline the process through which seafood commodities (input) are transformed into retail delicacies (output) in a fluid system; anyone can enter at any point in the process.

Despite this complexity, on a designated weekend every four years the market shuts down and all of the over 2600 wholesale stalls move their equipment out while the interior architecture is dismantled, removed and reconfigured.[23] Wholesalers move back in to the market in newly assigned locations and are open for business the next working day. Because economic advantage is directly tied to location, this reorganisation and re-allocation of internal real estate neutralises disparities between vendors by not letting spatial advantages or disadvantages permeate individual business prospects for the long term. Such an approach to reconfigurable spatial and economic planning is an attempt to realign the organisational systems governing the market, both social and institutional, with the precise idiosyncrasies of the space. The move recalibrates the intensive limits within the market (economic, social and institutional patterns) with extensive limits of the physical complex itself (the space of the market including infrastructure, lighting, proximity, scale, size, location, etc). In short, the four-yearly move has the effect of continually restructuring relationships between power, money and space.

As an historic market Tsukiji is centrally located and easily accessible. As a factory and site for production however, it occupies a piece of real estate unheard of in contemporary urbanism. Threats to move the market across the bay to an industrial site and free the current space for more commercially attractive purposes have been ongoing for some time. Arguably it is the intense and vibrant combination of production and consumption that makes this market so vital and significant for locals and tourists alike, and why resistance to relocating it has so far been very strong. Tsukiji provides an important example in this sense, of how messier functions in the city (such as Gibson's 'welding on the sidewalk'), can coexist with cleaner, more 'upscale' functions such as retail and commercial space. Indeed the luxury shopping and lifestyle district of Ginza is a block away. Tsukiji also proposes a model whereby production is not isolated or marginalised from the city but integrated with it and its public functions, even if in small ways. Further, given the increasing tendency toward locally grown food production and seeing where one's food comes from, this is a progressive historical model. As cities depopulate, de-centralise, de-industrialise or otherwise renew and reinvent themselves, the complex economic-spatial practices demonstrated within Tsukiji provides an interesting model of urbanism that counteracts a singular orientation towards growth. Instead it remodels and reconfigures the growth of its elements and programs, periodically and dynamically, in the face of other urban fixtures.

23 BESTOR, T. C. (2004) *Tsukiji: The Fish Market at the Center of the World*, Berkeley, University of California Press.

Tsukiji Fish Market (2005)

Tsukiji Fish Market (2005)

Tsukiji Fish Market (2005)

Tsukiji Fish Market (2005)

Tsukiji Fish Market (2005)


半 290
1枚 450
2枚 850
3枚 1280
4枚 1700
1本 2560

Teleport

Teleport Town, located on the reclaimed island of Odaiba in Tokyo Bay, is also a key site for this research in terms of extreme economic shifts and the residual spatial conditions they create. In Tokyo during the economic bubble of the late 1980s extreme inflation in land prices made the production of new land for construction a very lucrative endeavour. This resulted in a series of major reclamation projects in the Tokyo Bay. At that time, one square foot of land in the luxury Ginza district was selling for upwards of US$24,000, making the prospect of developing new property in the bay potentially cheaper than buying existing land in the mainland city.[24] Teleport Town is an outcome of this era, developed on the reclaimed island of Odaiba, which was originally designed as a model for a self-sustaining city of 100,000 people.

The impact of the economic crash on this development was so severe however, that many of these highly speculative projects were terminated midstream. Large mega-structures were left vacant or unfinished, their iconicity shifting from one of prosperity to one of vulnerability almost overnight. As Thomas Daniell has described in his book *After The Crash,* "Major construction projects are very difficult to launch, yet once in motion their armatures of vested interests make them equally difficult to stop – witless, unwanted golems that [continue] lurching toward completion throughout the worst years of the post-bubble recession."[25] Teleport Town remained for years in this stage, a vague and largely empty landscape dotted with isolated mega-structures. It has more recently become a tourist, convention and recreational destination with more promising levels of activity. However, the original master plan for Teleport Town as a new city and business centre was as ambitious as the real estate sales plan, leaving vast expanses of unbuilt space between major attractions. Active sites (such as a convention centre, Fuji TV headquarters, entertainment venues, etc.) are connected by an elevated monorail. Yet on the whole, the 'town' remains quite suburban in scale. It is a promising site for Hanru's post-planning efforts, not in this case to breathe liveability into a dense network, but rather for the opposite purpose – to instigate congestion into the 'density of emptiness' that Young saw in a de-populated Detroit.

24 BOGNÁR, B. (2008) *Beyond the Bubble: the new Japanese architecture*, London ; New York, Phaidon Press. p10.

25 DANIELL, T. (2008) *After The Crash: Architecture in Post-Bubble Japan*, New York, Princeton Architectural Press. p13.

These sites in Tokyo highlight several themes that are important for my research and further extend the discussion of Detroit's spaces of production. One theme is attending to relationships between spaces of production and public spaces, including the surrounding urban fabric. These are still remarkably intact and integrated at Tsukiji, which endures real estate pressures on all three sides and has direct urban waterfront access. Another aspect includes attending to the spaces of exchange around spaces of production, which in the case of Tsukiji serve to seamlessly connect the 'factory' to the central urban fabric. Prioritising the fluidity and reconfigurability of urban space is another point, regardless of how fixed or embedded such spaces may appear to be. Related to this, and returning to the discussion of urban transformation more generally, this research is especially focused on considering the kinds of emergent and alternative architectural practices that develop and operate in such integrated, variable, unfixed and transforming contexts. Further comparison here is warranted between the city-within-the-city model of recent mega-developments in Tokyo (or the Renaissance Center complex in Detroit for example), with more economically diverse and spatially integrated models that emphasise social, economic and programmatic accessibility and flexibility.

Examining specific examples of unfixed functioning spaces, as well as those that exist between states of change, does potentially more for the consideration of future urban space than abstract analysis or sophisticated and expensive master plans. Just as practices of prototyping use constructed buildings as a way to affect change in policy (rather than the other way around), so might a continuous process of re-modelling or re-configuring the highly fluctuating and vibrant spatial mechanisms operating on the ground, in the city, work as a prototype for other sites.

Odaiba, Tokyo (2006)

Odaiba, Tokyo (2006)

Dubai (2008)

"The main drag in Dubai is lifted intact from the 1939 General Motors Pavilion. The after life of these "utopian" morphologies is both fertile and foul."

Michael Sorkin (26)

3. Dubai: unfinished bubbles

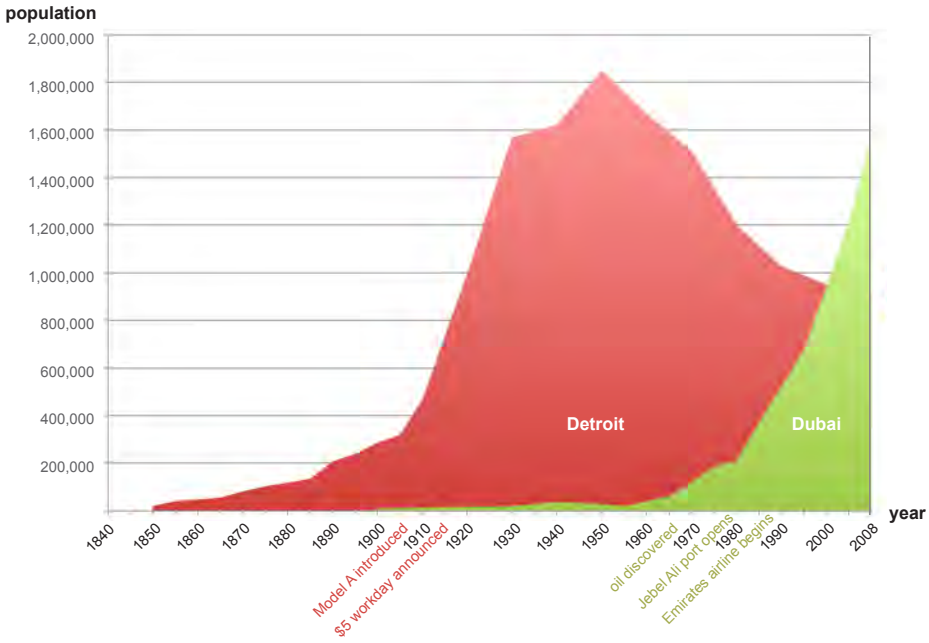
Speculations about the long-term viability of Dubai's massive urbanisation began almost as soon as the city's first towers arose. Dubai is a city built from scratch in the middle of the desert, supported privately and geared toward finance and tourism industries. It emerged in the form of superlative towers, manufactured beaches and iconographic landscapes, each of these variables adding yet another layer of volatility to the ambitious urban master plan.

While each component of the city strove towards unprecedented scale, luxury, technology or form, the overall pattern of Dubai's development has resulted in a series of interconnected and specifically themed 'cities' strung along water's edge (Media City, Academic City, Healthcare City, Industrial City, etc.) connected by a twelve-lane highway. Despite the novelty and ambition of the larger project, the processes informing the reality of Dubai resonate elsewhere. They echo similar patterns of urbanisation driven by similar economic conditions in different parts of the world. For example, Detroit and parts of Tokyo both emerged on the back of an economic boom, from the automobile industry and real estate speculation respectively, and both have negotiated the aftermath of boom-turned-bust. The patterns of retrenching are comparable to those of rapid expansion, despite vastly different locations and points in history. Dubai offers the third in this series of stories about urban expansion and contraction, especially to highlight some of the similarities in transformations and between them all.

Migration

The patterns of growth and population data for Detroit are incredibly similar to Dubai's industrial and economic development, and resulting urban transformation decades after. In the 1960s, while Detroit's population was rapidly migrating outside of the city limits, Dubai discovered oil. This was a moment that would do for Dubai what Ford's five-dollar workday did for Detroit. In the next 40 years the population of Dubai grew from 60,000 to 1.5 million. Workers came to Dubai for the promise of professional opportunity and financial compensation incomparable to that available wherever they were from, just as they did to Detroit decades earlier. This was also the incentive to endure unfamiliar and in some cases extremely harsh living and working conditions.

26 SORKIN, M. (2009) p9.



Population comparison between Detroit and Dubai

Unlike Detroit, however, the migratory populations in Dubai have tended not to remain in the country when opportunities recede, but instead repatriate or migrate elsewhere. This difference is at least partially due to differences in the economic structure of the industries upon which the cities were built. Where Fordism created both the product and the market for the product simultaneously, expanding the middle class and the industry itself in a perpetually reinforcing cycle, the imported workers in Dubai were not integrated into the city's larger social and economic systems. As Rem Koolhaas reported in 2007, the expats that comprise 80 percent of Dubai's population come either to enable the construction boom or to use it, but "with little emotional investment both plan to leave eventually."[27] Indeed Jerry Herron has remarked similarly about Detroit, "The people that came here never intended to stay;"[28] The difference is that in Detroit they did, for a while anyway, while in Dubai there is much less of a trace. It is a transitory hub 'halfway to everywhere,"[29] even for those who reside there. Meanwhile Herron has described the very city of Detroit as being always "on the way to becoming something else."[30] In Detroit's case the city is perpetually shifting alongside the population; in Dubai's case it may be too soon to tell what the physical legacy will be. In any case, given that both cities emerged on the back of mass immigration for financial opportunity it seems logical that this pattern and history would leave an imprint on their quality of urbanism. Founded on impermanence and volatile investment, they continue to exhibit patterns of impermanence and persistent volatility, despite striving directly towards the opposite.

Engineering

An economic bubble often marks one of the most innovative and supportive periods for architecture in a city's urban history. Architecture rarely receives the same level of public media, financial backing, and cultural significance than during an economic boom. Detroit experienced this architectural upsurge in the early twentieth century, when 95 percent of

27 KOOLHAAS, R. (2007) 'Import Expat,' in *Al Mahakh*, Volume 12, Netherlands, Stichting Archis, p292.

28 HERRON, J. (2010) 'Borderland/Borderama/Detroit' in G. Wilkins, ed., *Distributed Urbanism: Cities After Google Earth*, Abingdon, Routledge.

29 KOOLHAAS, R. (2007) P138.

30 HERRON, J. (2010)

all downtown Detroit high-rises were completed in a four-year span, between 1925 and 1929.[31] Bubble conditions act as a sort of architectural shock treatment out of which new talent, new types of building and in some cases wholly new cities emerge. Dubai and Tokyo certainly share this particular history, as the explosion of building projects during the bubble years allowed younger architects to gain commissions previously reserved for an established few, and where experimental approaches were not just supported but strongly in demand by clients, city administrators and the general public alike.

In such contexts, bubble-era architecture in both Dubai and Tokyo has also served to elevate the role of the engineer as equally (or more) important than the architect. The combination of immensely scaled projects and the strong push for iconic visibility demanded structural innovation across architectural and urban scales. Botand Bognar's description of bubble-era architecture in Japan could have equally been said in reference to Dubai:

> *[It] did not shy away from applying cutting-edge technologies. On the contrary, the bubble years seem to have been a time when architects and engineers were poised to test how far they could push their limits of their abilities in harnessing the potential of technology. This held true in terms of both 'hardware; (structural or constructional) but, even more so, 'software' (electronic or computer) technologies, although the two in most cases complemented each other, as at Kansai airport or Sendai Medi-atheque.*[32]

In Dubai also, new structural and technological strategies go hand in hand with spectacular architectural designs, the combination of which enables the superlative urbanism these cities strives for.

Dubai has furthermore 'retested' some structural and programmatic experiments conducted during bubble-era Tokyo, including artificial islands and indoor/outdoor environments. One of the first indoor ski slopes, the LaLaport Skidome SSAWS was built outside of Tokyo in 1993, but closed ten years later, 15 years before reaching the projected financial break-even point. It was replaced by an IKEA, marking a clear shift from high to low financial risk (not only for IKEA's status as the world's largest furniture company but also a harbinger of suburban expansion). SSAWS redux is Ski Dubai, a slightly smaller version that opened in 2005. It is physically attached to the Mall of the Emirates, such that the mall acts as an expanded ski lodge, where both skiers and shoppers congregate, eat, and watch**.** By comparison to Tokyo, Dubai's model allows a risky business to be absorbed into a safer one, SSAWS into IKEA, however it also makes it more difficult to separate these should the facility suffer the same fate as in Tokyo. This recalls the photographically famous Michigan Theater in Detroit, which has been disused

31 HERRON, J. (2004) 'Chronology: Detroit since 1700,' from *Shrinking Cities: Detroit, Working Papers* Part 1, P. Oswalt, ed., Cultural Foundation; Gallery for Contemporary Art, Leipzig, Bauhaus Foundation, Dessau, Germany.

32 BOGNÁR, B. (2008) p17.

for decades but is structurally integrated with the functioning office building adjacent. It therefore was not demolished when parking was proposed for that part of the block, instead a new parking deck was installed within the theatre building shell.

Reclaimation

Where Tokyo developed the reclaimed island of Odaiba into Teleport Town during its speculative economy, Dubai looked similarly at reclamation projects at the water's edge. This wasn't so much an attempt to increase land or waterfront access but to multiply the coastline and encourage tourism, the industry upon which Dubai is reliant given the very limited oil resources. The coastline in Dubai is a malleable contour operating at two scales, locally for the gated housing complexes and globally as an icon for the city, viewable from above (and from Google Earth, from anywhere). Unlike aerial images of the Palm Jumeirah the experience of viewing Dubai by satellite is strangely urban, strange insofar as it is a single strip of road extending into the sea. Roads dissect large, closely spaced housing estates and the water is only visible within private estates.

The quickness with which Dubai transformed from a desert colony to an international tourism and financial hub is nothing short of astounding. It stands to reason that a similarly rapid transformation could happen in the next phase of its downturned development, along architectural, economic or social trajectories. Perhaps Dubai will shift into a 'forensic' practice, as took place in Tokyo and Detroit after the financial investment receded. The *Stalking Detroit*[33] publication and Atelier Bow-wow's *Made in Tokyo*[34] and *Pet Architecture Guide Book*[35] are projects of this sort that approached the city similarly in this aftermath. Or perhaps it will be rescued by neighbouring Abu Dhabi. This would be politically complex given the overlapping politico-familial structures governing the country. Arguably, the major difference between Dubai's post-bubble future and that of both Tokyo and Detroit is a technological one. Widespread use of the Internet didn't exist during Detroit's rise and fall or during Tokyo's bubble years. Dubai on the other hand would have been impossible to achieve without it. The international network of practices that helped shape Dubai's emergence and the range of web-based tools that allowed broad participation in the city cannot be underestimated in terms of its current situation and future trajectories. These tools have triggered a wholly new form of urbanism in Dubai (and elsewhere), one which links Dubai always to other economic and architectural networks. In this sense, we will all participate in the next phase of urbanism in Dubai, whether remotely, vicariously or directly.

33 DASKALAKIS, G., WALDHEIM, C. and YOUNG, J. eds (2001) *Stalking Detroit*, Barcelona, Actar.

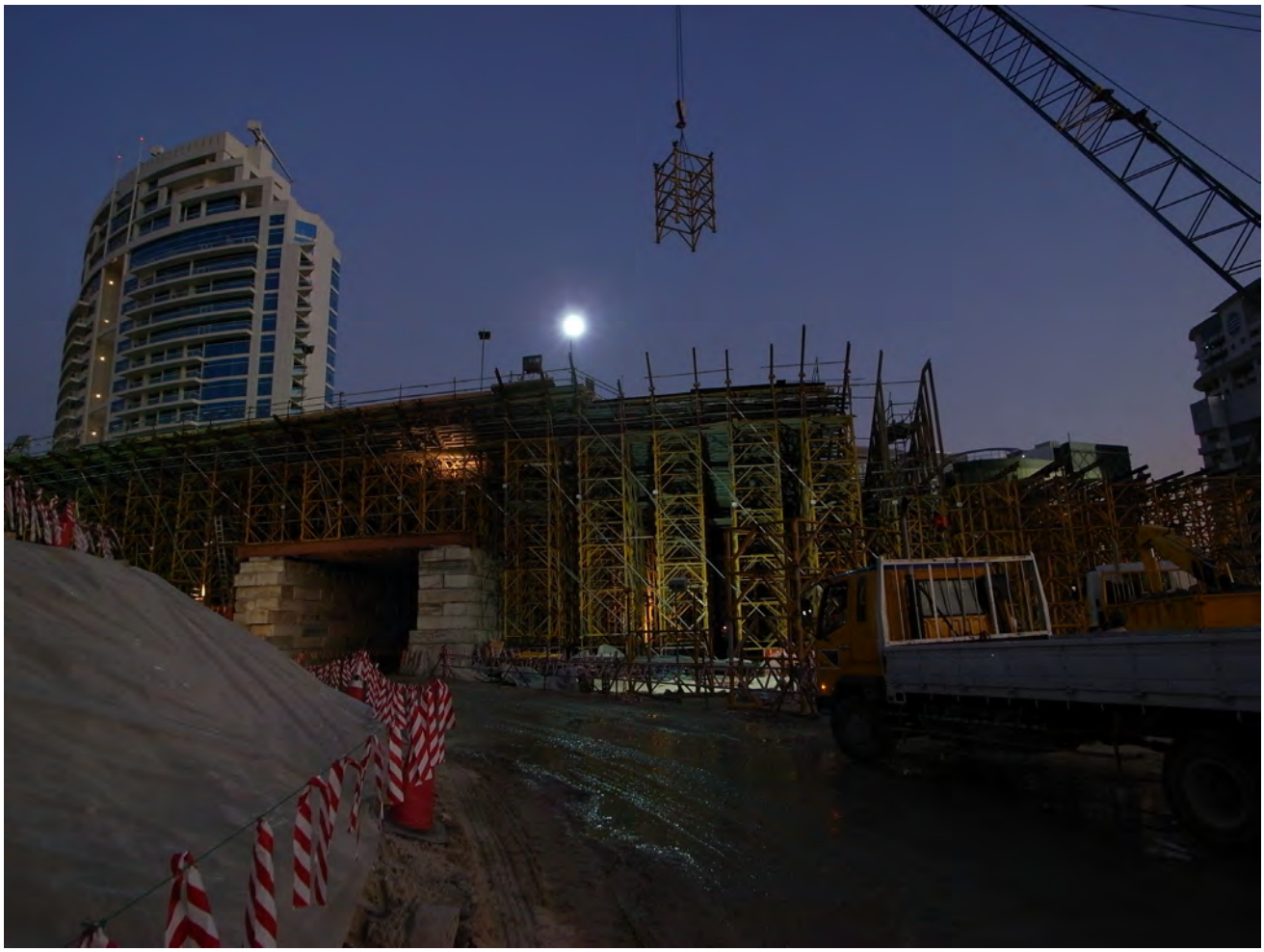
34 KURODA, J. and KAIJIMA, M. (2001) *Made in Tokyo: Guide Book*, Japan, Kajima Institute Publishing Co.

35 ATELIER BOW-WOW (2002) *Pet Architecture Guide Book*, Japan, World Photo Press.

Dubai (2008)

Dubai (2008)

Dubai (2008)



Dubai (2008)

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Conclusions

New Obsidian is the name Jane Jacobs chooses for a fictional city in her book *The Economy of Cities,* an argument for the primacy of urban rather than agriculture growth historically. Jacobs' story traces the process by which a raw material becomes a commodity, leading to social and economic exchange, leading in turn to urban growth, the diversification of industry, advanced economic systems, new industry, and so on. It is a story about patterns of urban development based on making and trade, rather than farming and settlement. Products are made, people come to do work around them, and to consume, the city organises around production, production changes and so the city changes. This type of urban development pattern is the fundamental basis of the cities explored here, and the processes through which a future architectural practice is framed.

Between each of these phases of development, in Jacobs' narrative or the stories of Detroit, Tokyo and Dubai, are gaps, and the gaps are more specifically where my own research is situated. Gaps between phases or stages in the process of urbanisation trigger, if not demand, new ways to consider urban space, urban design, architectural practice and future trajectories of cities in general. Examining these gaps and the cities that exhibit them most legibly and dramatically, such as Detroit, Tokyo, and Dubai, reveals a striking fluidity of change. Despite their durability and longevity, many cities demonstrate that there are potential instabilities lurking behind the concrete facades. Cities change constantly, but some more visibly or drastically than others. Despite tragic cases of loss and decline, the instability of these cities can also be taken as fundamentally optimistic. If Detroit changed once it can change again. As Gibson suggests, unfinished cities are the most open to innovation, after all. Such cities, however, also present cautionary tales for mature and stable cities, because no city knowingly or deliberately engineers its own decline. Detroit, for example, is a victim of its own success.

"The city is precisely that which exceeds our capacity to draw or describe it. To figure the city out is already to change it. A description of the existing city already constitutes a complete redesign."

– Mark Wigley (36)

36 WIGLEY, M. 2002 *"Resisting the City, in TransUrbanism"*, NAI Publishers, Rotterdam, p118

The cities discussed here are special cases to be sure, and they are challenging on every level: from a planning perspective, in terms of inhabitation, infrastructure, land value and many other factors that do not apply as directly to more stable states of urbanism. As unfinished projects however, they also present unprecedented opportunities for innovation, at least in the case of architectural and urban design practice. Detroit and post-bubble sections of Tokyo, and so far also Dubai, have all presumed to be aiming towards permanence in the midst of economic volatility. But an equally compelling alternative position for these cities and those like them, might be to embrace perpetual change, as Roger Sherman's quote about Los Angeles at the beginning of this section suggested.

Are any cities ever finished? Gibson's examples might be London or Paris, describing how they no longer offer the diverse economic and artistic opportunities they once did, and are therefore by his definition 'cooked'. But if we accept that all cities constantly change then strictly speaking perhaps the answer is no, there are no finished cities. Cities are always ongoing projects. However, the cities included here exemplify the extreme edges of that transformation, and the spatial practices that may result. It also highlights that not all change is the same, and that particular forces or triggers of change are more extreme, rapid or detrimental than others, or conversely, more productive. Recognising the mechanisms through which change[37] occurs offers ways to intervene into it, either to counteract negative changes, such as urban abandonment, or to counteract the negative repercussions of positive change, such as the homogenising or innovation-supressing tendencies of maturation.

The ideas captured in this chapter, and narrated through the urban case studies, present the core themes of the urban stream of my research. The core outcomes of this work have to do with identifying ways in which architectural practices can operate in response to such specific urban transformations. Some of the key points are resiliently (as distinct from, but not excluding, sustainability), opportunism and scale, and persistently attending to the question of how architecture intervenes or otherwise participates in these highly fluctuating urban conditions. The instability of the city itself warrants reconsideration of the 'stability' of any professional practice even. These consolidated reflections and approaches inform the proposal for practice discussed in Chapter 6, which takes the transforming city as a subject, a site and a model for resilience.

37 One way this work has considered this is in terms of 'infrastructure', informed by Sanford Kwinter and Daniela Fabricius's discussion in "Urbanism: An Archivist's Art?"

Ford River Rouge factory, Detroit. Photograph by Robert Frank.
(Image: http://whitney.org/ForKids/Collection/RobertFrank)

Chapter 4: Industrial Practices

Reclaiming post-industrial work

Overview

Cities emerge through making things. As the mechanisms and processes of making shift over time, so do the spaces and practices around them. The gaps between phases of production, or lulls in economic or technological activity, are not unproductive ones; on the contrary, they trigger new applications and methods of making as well as produce useful material by-products. Extending aspects of the discussion of urbanism in Chapter 3, which aimed to make sense of urban opportunities within the evacuated city or in the wake of economic collapse; here I am attending to the residual effects and implications of those urban shifts, namely around outmoded industrial manufacturing. The research hones in on specific material and architectural practices that exploit the gaps resulting from shifts of industry, such as recycling, up-cycling and optimising cast-off materials for architectural use. I also highlight the networks that organise the distribution and exchange of material for industrial manufacturing, which prefaces the work of Chapter five. This chapter is divided into two parts: the first part introduces ideas of resourcefulness in a framing text, and the second provides a collection of architectural projects that research these ideas through design. The essay contextualises my own practice research historically, conceptually, and geographically.

"Futurism formulated it, Moholy-Nagy probed it and began to repertory it, but only Fuller, in his hubris and madness, systematised it. Design, he showed us, must attack the entire world; its task is to produce "advantage' over adversity or hazard, to embrace work-potential wherever and whenever it exists

. –Sanford Kwinter (1)

1 KWINTER, S. (2008) 'Fuller Themselves' in *Far from Equilibrium: Essays on Technology and Design Culture*, Barcelona, Actar Press. p61.

Background: Something from nothing

This chapter addresses my longstanding interests and practice-based experiments around the notion of limits, specifically as pertain to the material, regulatory or economic systems within which architecture operates. At the core of this is an interest in transformation: how something might be transformed into something else, specifically in cases where the starting point is extremely limited or naught. While this work is related to current research on post-industrial urbanism, the geographical and cultural contexts for the work are a legacy from projects initiated a decade ago, beginning with my Master of Architecture thesis. During that time I volunteered in a state women's prison teaching educational and art-based workshops. The program was an initiative by the University of Michigan to encourage and facilitate creative arts and higher education in local correctional facilities.[3] My involvement was motivated from several factors, including social and political awareness of the prison industry in Michigan and in the United States and in general, but also a professional investment and emerging interest in the relationship between institutional and artistic practices. This was inherently a question about creative openings found within the limits of prescribed or regulatory systems, especially organisations of control. In the context of the prison, creative practices can of course act as a virtual liberation from physical confinement, but the agency of these practices extends beyond the institution, bringing cultural and industrial limitations to bear on each other in much more complex ways.

"The crossovers between product and environment, use and reuse, are increasingly at the heart of our urban experience."

- Jonathan Bell (2)

It has never been fully clear to me if my involvement in prison education programs informed my architectural interests at that time or the other way around; my initial Master's research focused on the prison building and the role architecture plays in negotiating limits of freedom and control. Over time this research expanded into more complex socio-political issues around discipline and surveillance, tracing the lineage of Bentham, Foucault, Deleuze and de Certeau, and towards discourse on utopias, dystopias and heterotopias. This extended to conditions of restriction outside of the prison walls, such as quasi-institutional environments, 'voluntary prisoners,'[4] (self)-restrictive architectural covenants and so on. Ultimately my final thesis explored the various ways in which creative practices could operate through those systems architecturally. More broadly however, this PhD situates that exploration in terms of resourcefulness within economic, strategic or spatial limitations, such as the limits embedded within both material/industrial and urban conditions.

2 BELL, J. (2003) "Ruins, Recycling, Smart Buildings, and the Endlessly Transformable Environment", in A. Blauvelt, ed. *Strangely Familiar: Design and Everyday Life*, Minneapolis, Walker Art Center.

3 The Prison Creative Arts Project (1990) Full mission statement, accessed June 2012 <http://www.lsa.umich.edu/pcap/whatwedo/michiganprisonartsinitiative>.

4 KOOLHAAS, R. (1995) 'Exodus, or the Voluntary Prisoners of Architecture' in *SMLXL*, New York, Monacelli Press.p5.

For example, the prison workshops were set in extremely restrictive contexts with the goal of cultivating creative, participatory work. All materials had to be pre-approved and accounted for with strict limitations on the type and safety of any tools. Partly because of such constraints the prison environment encouraged, or indeed required, participants to transform everyday materials as artistic ones. Toothpaste became a substitute for glue, pens became carving tools, and food was a source of colour. Of course the entire act of producing artwork in such a context was socially and individually transformative, turning trauma and idleness into productive activity; and this was of course the larger aim of the program.

The design perspectives and strategies developed amidst such obvious material and ideational constraints came to inform my early-career projects, which focused on the exigencies and material economies of building. This work entailed redistributing the efficiencies of mass-produced residential construction, as well as recycling and repurposing cast-off industrial materials in a series of design-build projects. Eventually this would lead to a series of collaborations with underemployed automotive fabricators from the shrinking Detroit industries, adapting their technical skills and material expertise to our architectural projects. This work was done with Ply Architecture and Wilkins + Comazzi Design.

This lineage, of adapting industrial skills, transforming materials and testing limitations within industrial or economic systems, established the trajectory for my current PhD research. That work began by asking how confinement and creativity interact in the context of the prison; leading to a more complex series of questions about relationships between freedom and control broadly, finally testing those questions speculatively though the economic and social establishments of the American housing industry. The research was then put to practice collaboratively within the downturned manufacturing industries of Detroit, and now finally comes to ask how limitations across a broader range of industrial and urban systems enable new sorts of architectural and design values to be cultivated and articulated across a broader range of outputs, using my own (and others) design work as a source of and outlet for research.

Work begets work: recasting labour & material

As a legacy of that early research and collaborations with industrial manufacturers, Detroit urbanism re-emerges in this chapter as a launching point. Dramatic shifts in industry are often accompanied by equally dramatic shifts in the value of space and materials, leading to new types of products, forms of work and business practice. This is true of growing and declining industries alike; as emerging industries instigate new products around them, and shrinking industries encourage new applications for undervalued skills, outmoded techniques and disused infrastructure. The economic decline of Detroit has produced a host of entrepreneurial practices, including do-it-yourself community design and art projects,[5] the self-initiated provision of local infrastructure and services such as street lighting and trash removal, and some illegal (but lucrative) architectural and metals scrapping business.[6]

Indeed an entire industry has emerged in Detroit around the collection and exchange of manufacturing waste and by-products, fostered by proximity to the international USA-Canada border. Detroit is the busiest international border crossing in North America, mostly due to the Detroit and Windsor-based automobile industries, but a fair percentage of the remaining activity is related to the trade of industrial waste between Ontario and Michigan. Toronto exports 100% of its toxic waste and most rubbish to the US, for example, and mainly to the area around Detroit, taking advantage of inexpensive tipping fees and landfill space as Toronto has no provision to handle waste locally. As a result, metropolitan Detroit effectively increases its total landmass by 11 million cubic yards per year with displaced Canadian trash.[7] Trash-trading in turn bolsters the economy of the Detroit; not an insignificant source of income for a region facing a continually reduced residential and commercial tax base.

Entrepreneurialism and resourcefulness are common in the wake of an economic recession, crisis or conflict, and tend to emerge under such pressures. The 'make do and mend' adage emerged during post-war Britain, for example, and was revisited recently following the 2008 economic crisis. The London Festival of Architecture in 2010 used this as their theme, calling for creative, architectural applications for repurposed materials. Our 'Fab-Pak' architectural design studio at RMIT[8] was one invited entry (see Fab-Pak project below) alongside a series of temporary urban installations by international architecture students.

5 such as the Heidelberg Project. Accessed 11 August 2012. <http://www.heidelberg.org>

6 Illegal scrapping of the Brodhead Naval Armory, Van Dyke Mansion and general domestic and industrial buildings are examples.

7 Department of Environmental Quality (DEQ) (2001) Report to the Legislature, Department of Environmental Quality, accessed July, 2012. < http://www.michigan.gov/deq/>.

8 London Metropolitan University and the Architecture Foundation (2010) *International Architecture Student Festival*, accessed May 2010, <http://www.lfa2010.org/event_types.php?t=6>.

'Resourceful' architectural and urban practices need not be limited to recessions or post-crisis conditions however, but do tend to flourish under pressure of some kind. Whole new cities in China are currently emerging from the trade of scrap left over from industrial manufacturing. Zhejiang has emerged from the collection and repurposing of waste packaging, plucked chicken feathers, tattered cotton and spent toothpaste tubes.[9] As these small, start-up industries expanded and diversified they created incredible, if still unofficial, wealth for a village that once had little to no economy. This story highlights the importance that the pressure of starting with 'nothing' plays in triggering economic or design ingenuity in the first instance, and how it works to feed the momentum thereafter. As The Economist reported in 2011, "It is commonly said that Zhejiang's greatest contribution to its citizens—and ultimately to China's economic resurgence—was to provide them with nothing and to cut them off from outside help."[10] Pressure is a key component of innovation, as extreme limitations demand creative approaches to oppressive situations, including downturned cities. As Rem Koolhaas remarked recently in an interview: "Cities are machines for emancipation. When the striving for emancipation is at its most intense, when there is the clearest promise of success, change is at its most intense."[11]

The immaterial analogue to creating something from nothing is the creation of new practices from existing practices. Jane Jacobs articulates the patterns by which this occurs through the fictional account 'New Obsidian' in her book *The Economy of Cities*.[12] The book is an argument for an understanding of the emergence of cities through industry (rather than agriculture), that is, through the processes and economies of making and production. In her account, as the processes of making and trade expand they trigger the creation of work from other work, industry from other industry. Examples include the sand suppliers creating sandpaper for carpenters in the city Minneapolis, and dressmakers prompting an industry for brassieres in New York. The same is true for plastic button manufacturers in Zhejiang, who eventually produced watches and then moved on to high-grade plastics for LED screens. The recurring pattern is that products arise on the back of other, failed or successful, products, and that labour arises on the back of other labour. As Jacobs articulates, "The point is that new goods and services, whether criminal or benign, do not come out of thin air. New work arises upon existing work; it requires "parent" work."[13] Work begets work.

9 The Economist (2011) 'Let a million flowers bloom,' in *The Economist*, accessed on March 10, 2011. <http://www.economist.com/node/18330120>.

10 The Economist (2011)

11 KOOLHAAS, R. (2012) 'Interview: Rem Koolhaas on the Invention and Reinvention of the City,' interview with Paul Fraioli, *Next American City*, accessed on June 1, 2012 <http://americancity.org/daily/entry/interview-rem-koolhaas-on-the-invention-and-reinvention-of-the-city>

12 JACOBS, J. (1969) *The Economy of Cities*, New York, Random House

13 JACOBS, J. (1969) p55.

In the case of growing industries, the spatial implications of this industrial development tend toward an expanded territory of production and exchange. A single, all-inclusive factory complex, for example, begins to outsource components and link to a host of smaller suppliers across local and international distribution networks. Detroit is again a clear example, developing from the original single factory model to a complex system of suppliers linked across local and international borders. Movement across this network is dictated by the local factory floor, amazingly; transport is curated through precisely timed exchange that aligns with the tempo of the just-in-time assembly line (even across the privately-managed international border crossing)

Jacobs' story is of urban growth following industrial growth. The same is true of urban decline, it follows industrial decline. In the case of shrinking cities, the remnants of industrial space, materials, tools and skills are left behind as the processes and economies move elsewhere. After some period of latency or vacancy these industrial artefacts are often brought back to life in some other form, never exactly the same but hybrids between past and present. New forms of digital craft are an example: reclaimed post-industrial sites such as New York's Highline project[14] are another. These projects trigger increase in economic value, diversification and new modes of work, alternate uses and generally increased levels of activity – social, professional or otherwise.

A local example of this pattern is the transformation of Cockatoo Island in Sydney.[15] Established as a penal institution in 1839, the first inmates of Cockatoo were put to hard labour quarrying stone and forging steel to build their own barracks, guard houses and staff residences. When the island was later established as a maritime centre, inmates built the dry docks, workshops and factories where shipbuilders manufactured colonial, naval and commercial vessels. When the maritime industry subsided several buildings were appropriated for use as an industrial school for girls, where students practised sewing and embroidery. Thousands of apprentices learned their trades through the industries located at Cockatoo, including sheet metal workers, painters, electricians, plumbers, and draughtsmen. Today Cockatoo Island is used for the Sydney Art Biennale as well as cultural events, music festivals and architecture workshops.

As an urban site and model that so visibly has connected the way things are made to the way places are made, Cockatoo Island is a mircocosm for speculating about future city-building, especially in terms of industrial production. As production methods change, and as industries transform and techniques expand, so does the city around them, sometimes

14 see <http://www.thehighline.org/> Accessed 15 August 2012

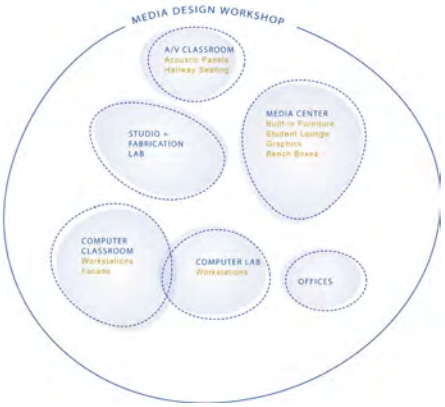
15 WILKINS, G. (2012), 'Urban Islands, Reform Through Making', in *Architecture Review Australia*, no. 123

incrementally and sometimes drastically. This becomes a cautionary tale in the case of Detroit or the mono-factory cities in China, which have been tooled for a singular type of output, and so live or die in alignment with that industry. Contemporary production, however, is more often than not a combination of techniques and processes drawn from across the histories and spaces of production: the industrial craft of Cockatoo and Detroit are incorporated into 20th century mass-production, and adapted toward 21st century mass-customisation, which leads to hybrid digital-physical forms of mass-collaboration. This shift in the way things are made triggers shifts in the spaces around their sites, and the city itself. As the Zen saying goes "how you do anything is how you do everything." Reforming the way we make anything will reform the way we make everything, and this is especially true of architectural and urban form.

Master of Architecture, Thesis (University of Michigan):
top: gated housing estate (green) , Scott Correctional Facility (grey);
bottom: panopticon, piranesi Carceri etching, Koolhaas Exodus image; 'The Bradbury' housing type

Projects: Design and Build

The seeds of my design practice were sewn in Michigan, where a series of projects tested various approaches to architectural production in the context of reclaimed materials, techniques and labour. This work predates the commencement of the PhD but is formative and foundational, and will be very briefly described here. Two key projects are discussed: a series of design-build workshops, studios and interventions at the University of Michigan,[16] and a publication I edited and contributed to on the work of Hitoshi Abe, entitled *On The Spot*. The Cleveland Case Study House competition and Horton-Kuwada house, both done with Ply Architecture, are documented visually. Our winning Case Study competition entry, a revisitation of the original competition by Arts and Architecture Magazine in 1945, was an early foray into the connections between prefabrication and (Midwest) urbanism. Two current projects are then described in greater detail: Fab-Pak, which comprises a series architectural design courses at RMIT University, and Snap School, an architectural design competition. Both of these projects were done in collaboration with Leanne Zilka and John Cherrey. The Fab-Pak projects were produced by Master of Architecture students at RMIT University across three semesters of architectural design studios.

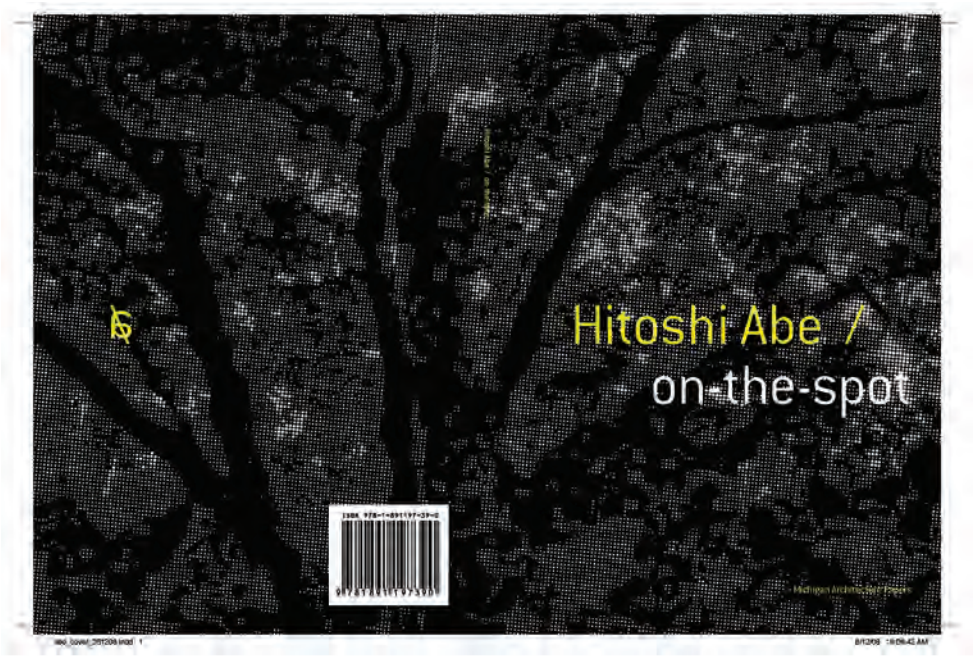


design-build projects by Wilkins+Comazzi Design (2002-2008)
University of Michigan, TCAUP

Rewind: architecture and industry in Michigan and Japan

The Design Build Workshop was a collaborative design program at the University of Michigan, within which Wilkins+Comazzi coordinated several projects from 2002-2008. The focus of the program was design and fabrication of full-scale alterations and permanent installations on the campus of the University of Michigan. These projects were developed through a curriculum within the architecture program, and offered professional experience for students with design, documentation, construction and coordination. The projects were instrumental in advancing my own research and practice experience with reclaimed and adapted materials, and in developing strategies for working with fabricators and other collaborators from the automotive industry, especially for re-use of plastics, sheet metal, recycled plastic tarpaulin, and the technical expertise related to these. As our work did not involve a high materials budget and the automotive industry was in short supply of jobs, the recycling of materials and recasting of labour was both a practical benefit and a design incentive. A mutually reinforcing design collaboration between this research and the industry itself created a hybrid pedagogical-professional setting which encouraged an experimental approach to design and construction, and instigated a series

16 in collaboration with John Comazzi as Wilkins + Comazzi Design, llc

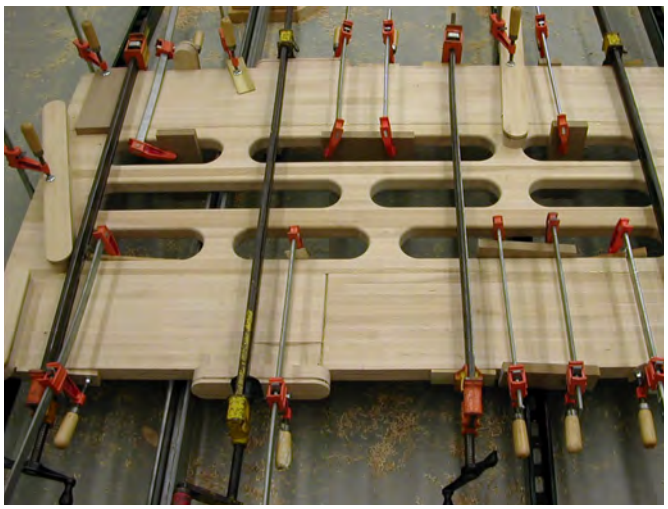


Cover of Hitoshi Abe: On-The-Spot (G. Wilkins, ed.)

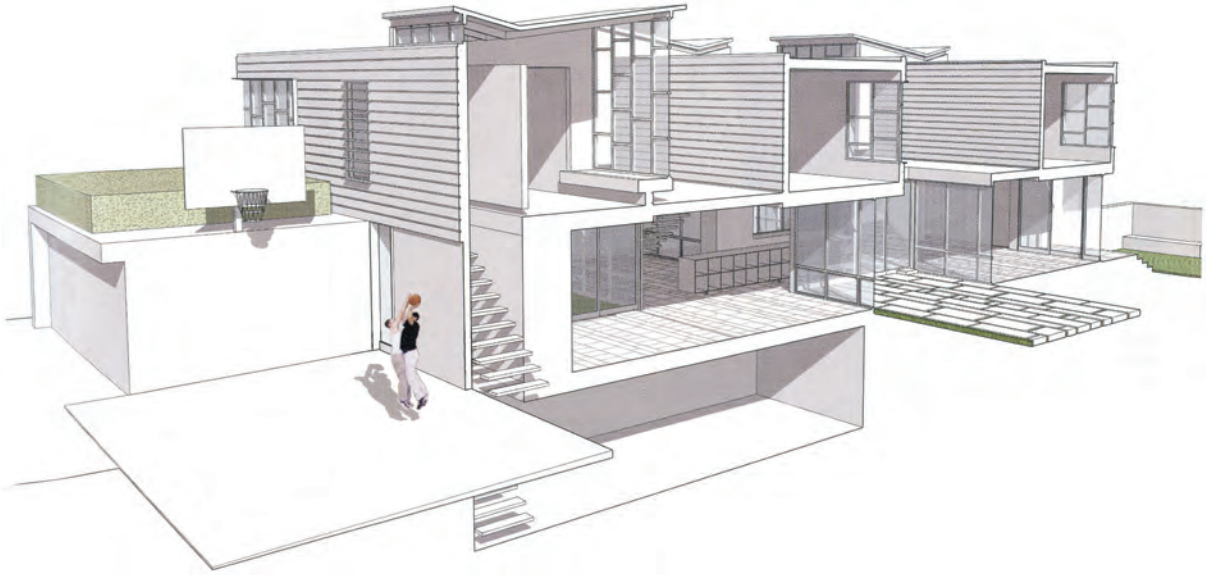
of projects that continues to inform my design studio teaching at RMIT University and PhD research. (see Fab-Pack, below)

The second early project relevant to this section is *On the Spot,* a publication I edited on the work of Atelier Hitoshi Abe, an emerging practice from Sendai, Japan. The book was published on the occasion of Hitoshi's delivery of the annual Dinkeloo Lecture at the University of Michigan in 2005, which celebrates innovative approaches to architectural technology in practice. The book focused on the construction techniques of a selection of projects, and especially Abe's collaboration with industries outside of architecture, such as shipbuilding. My research and practice interests have drawn from this close treatment of Abe's work, regarding it as a case study in alternative approaches to design, documentation and construction of architectural projects in collaboration with industrial manufacturing. There is also a distinct approach to scale resulting from his process, which operates as close as possible to full scale through prototypes and mock-ups, testing details experimentally-in-reality. My essay in the book draws a comparison between this aspect of Abe's constructed work and his interest in the relationship between architecture and the body, entitled 'Body Building.'[17] For my research it offers a useful example of prototyping in architectural construction, as well as the adaptation of industrial techniques, skills and materials to architectural practice.

17 WILKINS, G. (2008) 'Body Building' in G. Wilkins, ed. *Hitoshi Abe: On-The-Spot*, Ann Arbor: Taubman College of Architecture, University of Michigan.



Design-Build projects at the Taubman College of Architecture, University of Michigan (2002-2008)
(Wilkins + Comazzi Design)



HOUSE: Case Study Cleveland Competition (Ply Architecture) (2002)

Horton Kuwada House (Ply Architecture) (2003)

Fast Forward:

1. Fab-Pak design studios

A series of studio and elective courses I co-designed and co-taught at RMIT University continued this research through full-scale fabrication projects using reclaimed materials.[18] Looking to fabrication technologies as a way to bridge the gap between design and execution, this research tested various methods for the digital optimisation of flat sheet materials, specifically those which can be reclaimed from building and manufacturing sites. Focusing primarily on material constraints enabled creative approaches to the reuse of residual building materials in fabrication, also working to reduce the amount of building waste in construction. Digital information and scripting processes were embedded into material systems in order to rethink the relationship between input and output in design, especially in the context of sheet material manufacturing, reclamation, fabrication and distribution. Two projects evidence this research, conducted through architectural teaching and design practice, discussed below. The contribution of this work lies in the approach toward connecting digital and material techniques for reprocessing off-cut sheet material, and a method through which to extend the limits of these materials as a result.

Material by-products

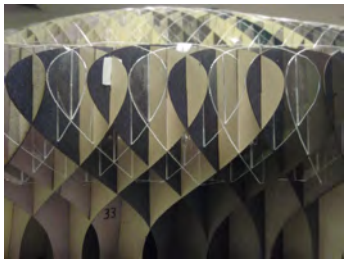
The eccentric nature of scrap materials is typically the strongest limiting factor in potential reuse or alternative application. The sizes, shapes, composition and quality of the unused or residual material stock are unpredictable and endlessly varied. While some materials may be crushed, melted or chipped for remanufacturing into a product of lesser quality, the reuse of off-cut, scrap or damaged materials for new architectural systems (as opposed to customised, single objects) without employing energy-consuming processes, is rare. The question of how it is possible to standardise a re-manufacturing process when the nature and properties of the material itself are generally unknown in advance is also difficult. Given the wealth of information around digital design processes however, and the increasingly widespread availability of advanced fabrication tools, it is increasingly possible to develop a method of mass-customising reclaimed waste material that does not substantially increase the embodied energy of the material, nor substantially decrease the quality or formal possibilities of the output. This work endeavours to develop 'smart' reclaimed architectural products that might also embody the systems of information used to reprocess them. That is, to digitise, systematise and script eccentric or off-cut sheet materials, and reassemble them into architectural projects.

18 RMIT Architecture students involved in Fabpak projects (2009-2011):

Proxy Studio (2009): Khai Ling Chan, Aziza Velagic, Timothy Eastaugh, Emily Lyons, David Christiansz, Muizz Nazmi, Ignacio Ramos, Anthony Zito, Hong Wei Zhao, Qi Zhang, Novia Lembing, Luca Lana, Andreas Tourogiannis.

1:1 studio (2010): David Christiansz, Claire McGuire, Adrian Rivalland, Oscar Sainsbury, Claudio Sanzaro, Shann Ching Pei Yong, Laurence Yat Laam Chan, Maximilien Forget, Timothy Heron, Mathilde Lucas Nurulain Noor, Mhairi Macleod, Lukas Maehr, Bo Zhang, Nik Kellina Bakti, Ahmad Shazilly, Jonathan Barzel, Ashini Kulatunge, Xiang Li, Bronwyn Litera, Brahman Perera, Wai Ting So, Simon Wright, Hong Wei Zhao, Mak Alex, Lee Yi Ting, Paul Ahern, Xiaozhou Qin

Three Little Pigs Studio (2011): Oscar Angel, Bakalele Chisiza, Morgan Collins-McBride, Jugh Feggans, Jane Houston, Haziel Mitra, Jing Qian, Nicholas Rossetti, Benjamin Stafford, Bo Sun, Feng Zhang, Tianchong Zhu, Emielie Holmberg



Sliceform Project (above and left) (students: Barzel, Forget, Kulatunge, Litera, Lucas)

The Fab-Pak studios at RMIT were designed to engage this question through two projects over two semesters. The first (2010) used reclaimed laminate sheet material and the second (2011) expanded the inventory to plywood, aluminium, tarpaulin and foam. Each year in Australia nearly 500 tons of industrial sheet materials are sent to local landfills in Victoria alone. Much of this waste is produced from off-cuts on building sites or full sheets deemed unusable by the manufacturer because of small faults, such as chipped edges, surface inconsistencies or superseded colours. As such, most discarded material has not lost any of its original use-value from degradation or substantial defects, but is simply impossible to sell or resupply, or exists in odd shapes which frustrate standard manufacturing techniques. To develop a system that harvests this material means relieving suppliers of the liability from small defects, and developing options for reprocessing through digital fabrication techniques. It also makes it possible to create a new material resource that satisfies industry needs as well as increases opportunities for building trades. The laminate studio project engaged this challenge by asking how digital reprocessing might be used to optimise the material surpluses created within the building industry.

The laminate design studio worked in conjunction with national materials manufacturer The Laminex Group, a major producer of laminate sheet building products, large portions of which are regularly discarded into landfill for superficial defects. Laminex provided material in exchange for new ideas about how their material might be reclaimed, reengineered, reused and resold. One of the intended outcomes was for Laminex to effectively decrease waste production and increase applicability within various product lines.

Architecture students were given the tasks of reprocessing the material digitally, and designing an architectural system for 'urban furniture' that could be easily built with a minimal amount of waste and without the need for highly skilled labour. To encourage material efficiency the projects had to be flat-packable and easily assembled by others. Four full-scale projects were produced, later exhibited in London, Melbourne, Beijing and Shanghai over the course of six months in 2010. The projects were also presented at the Association of Computer Aided Design in Architecture (ACADIA) international conference in 2011,[19] and will be published in StudioPlex, a publication of international approaches to architectural design pedagogy in 2013.[20]

19 WILKINS, G., ZILKA, L., CHERREY, J. (2011) 'Scripted Materials', in J. M. Taron, V. Parlac, B. Kolarevic and J. S. Johnson, eds., Acadia 2011: Integration Through Computation, Calgary, Association for computer Aided Design in Architecture.

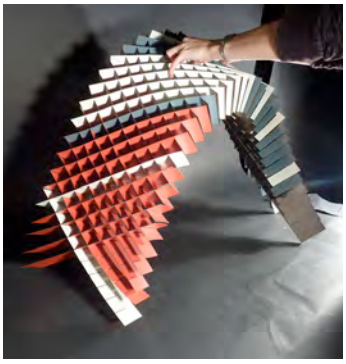
20 WILKINS, G., ZILKA, L., CHERREY, J. (2013) 'Fab-Pak' in M. Sharif ed., *Studioplex*.Los Angeles, University of California Los Angeles, Architecture and Urban Design.

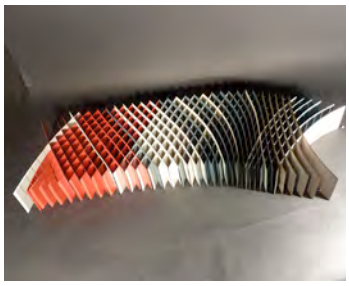
Process and material tests

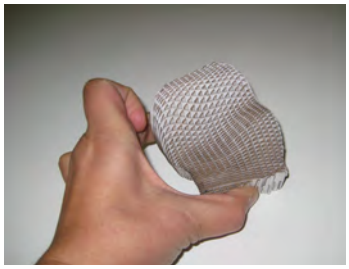
When architects and designers use scripting techniques in digital design programs, it is typically to assist with the generation of complex forms. Scripts generate models which are then developed into a buildable project for which the design and documentation team source material systems that best suit the overall idea. The Fab-Pak studios began at the opposite end of this process, starting with specific material systems and testing their structural limitations, strengths and aesthetic qualities in order to determine formal geometry, architectural assembly and scale, and installation for particular sites. The goal was to produce a design that could expand the range of discarded laminate material pieces through computational processes rather than applying the material off the shelf to a design.

The first stage of work therefore was dedicated to assessing the strengths and weaknesses of laminate sheet materials. Students developed their knowledge of the material through one-to-one tests. They were then asked to design a structural assembly using only laminate material and combine a variety of 'input values', such as laminate specifications, rapid prototyping specifications and international shipping limits. This data began to suggest modular or repetitive units for ease of assembly and transport. The students initially developed physical models with pieces of cardboard, encouraged to use one material for all parts of the structures, including fixings, surfaces, and substructure.

Laminate was then substituted for cardboard and the scale of work increased to 1:10. Directly working with the material at larger scale enabled students to more directly confront the inherently brittle nature of laminate sheet and how it would behave as an assembly of both form and structure. At this early stage, all pieces were manually drawn, cut and assembled, and the resulting assembly was therefore a function of the material system only. So while the furniture pieces functioned to suit the sheet, they lacked a design. The students then began to use digital techniques to increase the complexity and variability of the components, and quickly test a variety of forms, shapes and configurations on site. Through scripting in Rhino and Grasshopper students were able to manipulate multiple irregular laminate sheets (off-cuts, drops, fragments) and optimise the complexity of fabrication. At this phase the two aspects of the work – digital design and material processing – became interlinked.



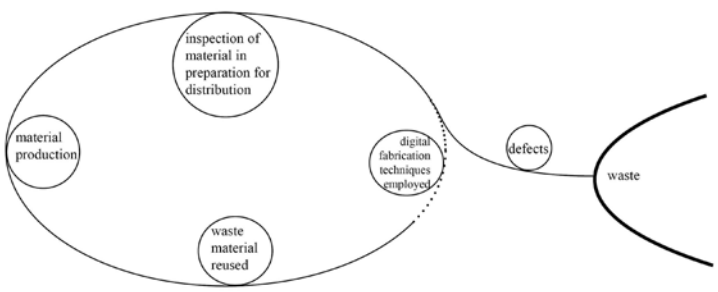




Material Networks: logistics of flat-pack

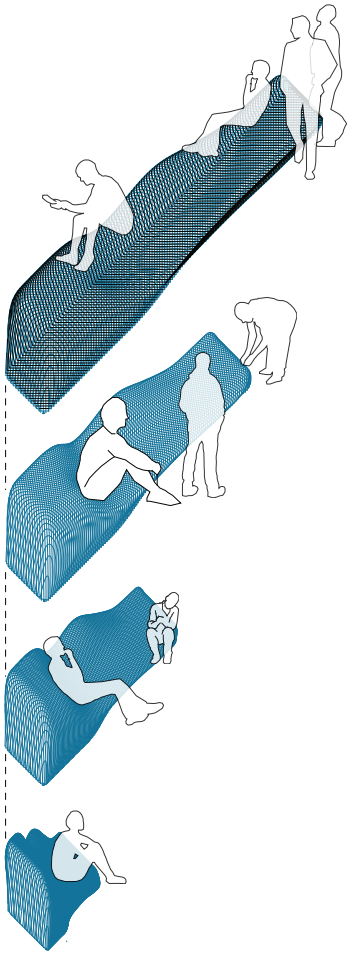
The digital optimisation of material waste allows for a variety of complicated constraints to be incorporated into a design process without compromising the quality of the final project or output. While the projects had so far been exploring how to apply material constraints to digital techniques, namely using scripting to deal with construction and fabrication issues, we also looked at transportation efficiencies in order to efficiently construct the projects remotely. The studio program was quite suited to working with flat-sheet materials. The main advantage of laminate sheet in this context is efficient transportability; it contains a dense packing weight within a comparatively low cubic volume.

The merging of digital information and material systems is inherent to the realm of international shipping and distribution logistics. This context combines information systems and spatial volume to enable the vast and complex coordinated global movement of things and people, locally and globally. The introduction of containerisation marked the moment at which production and consumption become disconnected, re-linked through information and logistics. Things can be made anywhere (where labour and land are cheap) and distributed to anywhere else (where relative costs are high), through digital networks of barcodes, RFID tags, communication streams and other mechanisms for tracking the location of physical things at any point and place in time. The implications of this shift for design disciplines are considerable, it has ushered in now common and highly effective models of practice combining distributed networks of design and fabrication. Small, nimble architectural practices have become able to replace large, centralised ones, where information and resources are shared across networks and twenty-four hour workdays maximise efficiency. Distribution has in this sense become a new form of design production. This will be discussed more in Chapter 5: Network Practices, but is useful to introduce here given the relevance and impact on the Fab-Pak design studio teaching.



Left: Sliceform Project (students: Barzel, Forget, Kulatunge, Litera, Lucas)
Above ('closing the gap' between manufacturing and production (L. Zilka)

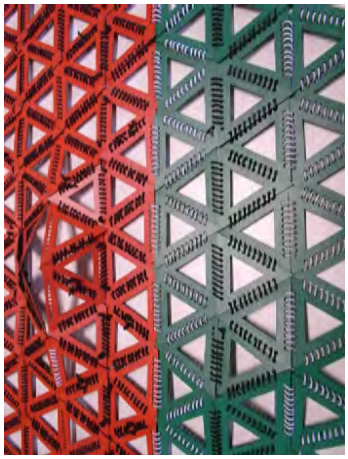
Our Fab-Pak laminate studio projects responded to with these issues through the requirement for remote assembly and installation. Student projects were required to understand and integrate shipping logistics and the mathematical formulas that determine optimal material configurations when transported across long distances. We considered these from the perspective of both express cargo freight (FedEx, DHL, etc.) and commercial airline carriers (checked luggage restrictions), using their limitations as a design input in order to determine the optimal component size, shape, weight and overall assembly out of the box. The final projects were shipped to London and installed as part of the 'make do and mend' international student design festival at the London Festival of Architecture in 2010. They were later shipped back to Australia and installed in Melbourne at the State of Design Festival, and then to Shanghai for the Cumulus exhibition at the Shanghai Expo, also in 2010.

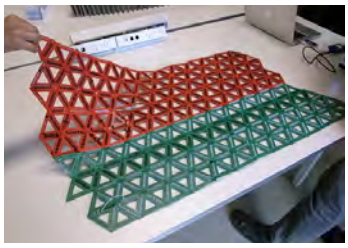


Scripting Materials

A second studio project reversed this design process again, beginning from an abstractly formal idea and then scripting the methods through which it can be digitally 'unfolded' into flat sheet components for full-scale construction. The coupling of sheet-based digital fabrication tools and modelling in this case revealed a gap between 2D output and 3D input; necessitating a range of tools to bridge this gap and translate between complex geometries and flat sheet-material. These tools are fundamentally similar to each other even though written for different modelling programs; they all endeavour to translate three-dimensional forms into two-dimensional surfaces which can be fabricated from flat-sheet material, and then re-folded back into the original shape. However, slight variations in each version of these basic programs resonates further downstream into the design and fabrication process. Each technique biases particular values that affect the 2D translation and ultimately the physical outcome, such as the location of seams, number of pieces, automation of tasks, density of triangulation or overall composition on a sheet. The different design programs that students tested included Pepakura, Lamina Design, Waybe, Rhino, Sketch-Up and Javaview. Each of these were found to translate between 3D and 2D differently, each closing the gap between input data and output material in a slightly different way. This experimentation with various programs was compiled into a catalogue of 'scripted materials' which documented how input variables in these digital translation processes are revealed in material artefacts, and compared programs and their actions on a set of given 3D geometries in order to isolate their inherent biases and tendencies.

Sliceform Project: in London (students: Barzel, Forget, Kulatunge, Litera, Lucas)





Softcore Project
(students: McGuire, Wright, Perera, Macleod, Maehr, Chan, Li, Ting So)

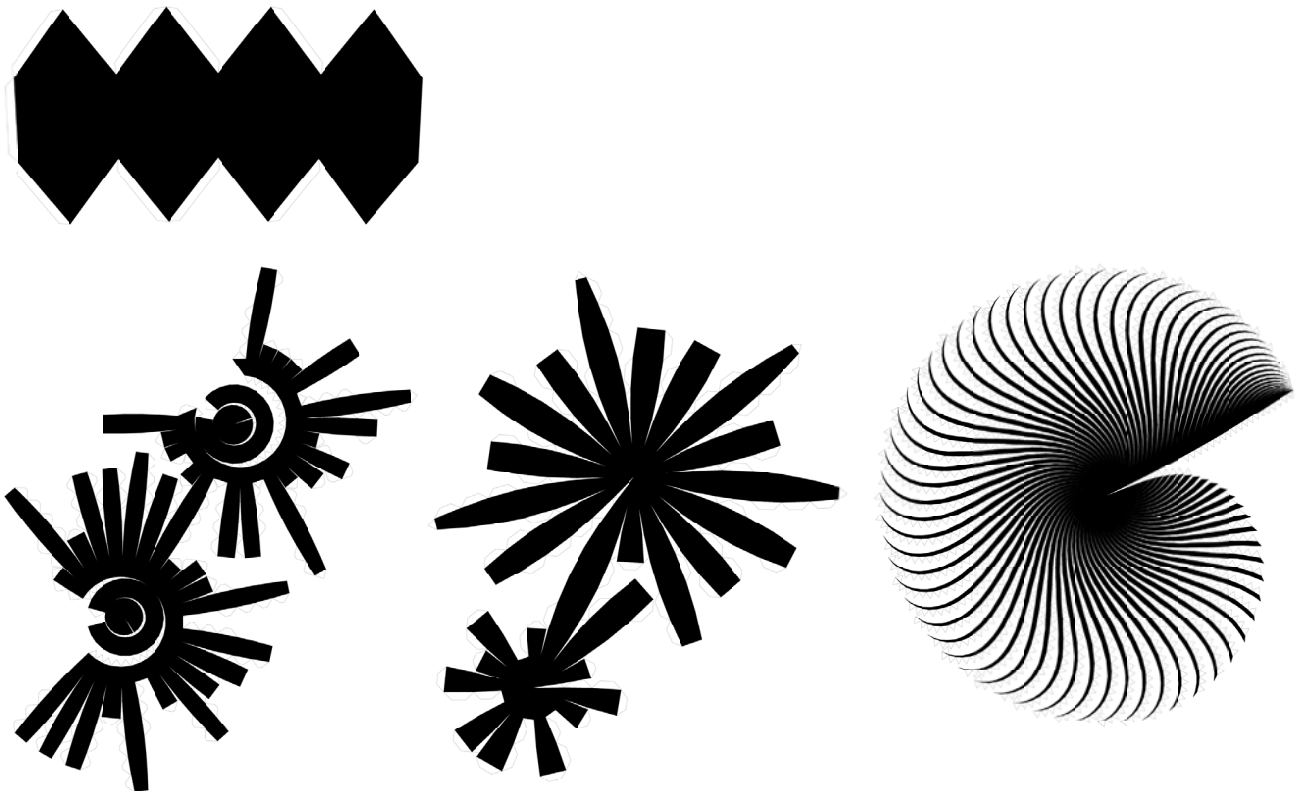
The standard shapes that were tested in each application were: a cube, cone, cylinder, rhombic solid, Rasmi dome, pyramid, sphere, ellipsoid, paraboloid, torus, Mobius Klein bottle, Klein bottle, Mobius strip and helix. While basic limitations and patterns were revealed and documented through this process, the most interesting outcome was discovering the 'tipping point' in each flattening process. This was the point at which neither the computer nor the author was fully in control, when process departed from the predictable script and 'self'-initiated a new way to solve the problem. The point emerged at the intersection between several values, such as resolution, (quantity of data), geometry (complexity of math), and computational efficiency (speed). When one of these variables was pushed beyond an operable limit the object would be unfolded in a way that only the program controlled, no longer adhering the same organisation, pattern or scale but approximating a series of points and lines (as opposed to strict polygons as intended). This was useful an example of when material and digital information became interestingly hybridised. What may have been lost in the translation between digital and material systems resulted in new patterns and elicited new potentials for how the design projects could eventually be built.

Scripting Assemblies

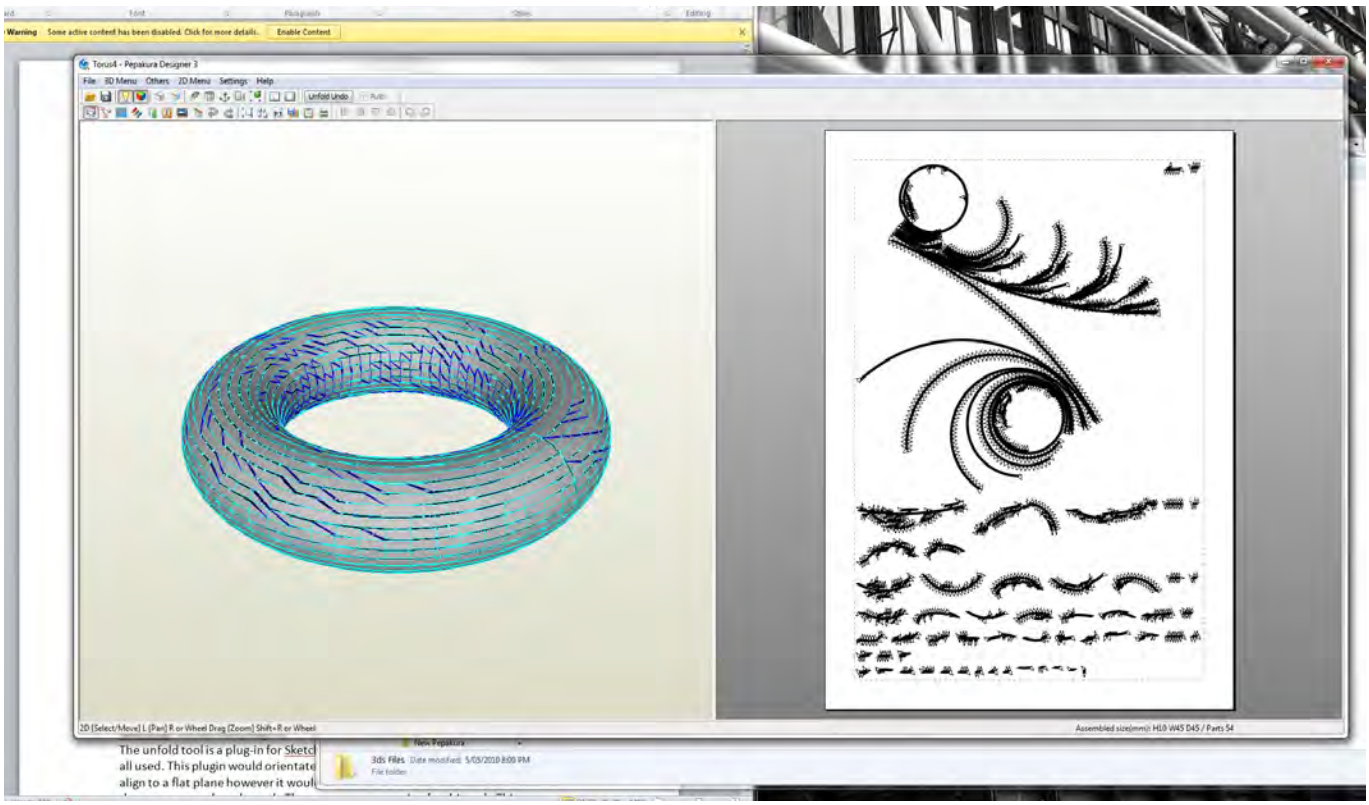
Based from these experiments with sheet-based laminate, the second of the Fab-Pak studios (2011) proposed to increase the range of material types and assembly systems: extruded aluminium was donated by Capral, pressed board by Laminex, vinyl and canvas sheet by Jamco Sign Services, timber from Austral Ply and foam by Dunlop Foams. These projects advanced the experiments from the veneer laminate towards a more fully integrated digital-material system, ultimately producing three mirco-shelters of metal, wood and fabric. The idea behind the micro-shelter was twofold. First, it increased the scale and complexity of the problem from urban furniture to an occupiable architectural space while still retaining a scale feasible for students to design and construct in the course of a 14-week semester. Second, it suggested the development a small building (or housing) assembly unit deployable across a range of sites or circumstances, such as a tree-house, playhouse, temporary shelter, demountable 'tent', or study carrel. In other words, while the laminate studio considered an architectural component to be a single piece of recycled material, this studio considered the small dwelling unit itself as a component that could be adapted or scripted as a 'unit' into a larger system and across a range multiple uses.

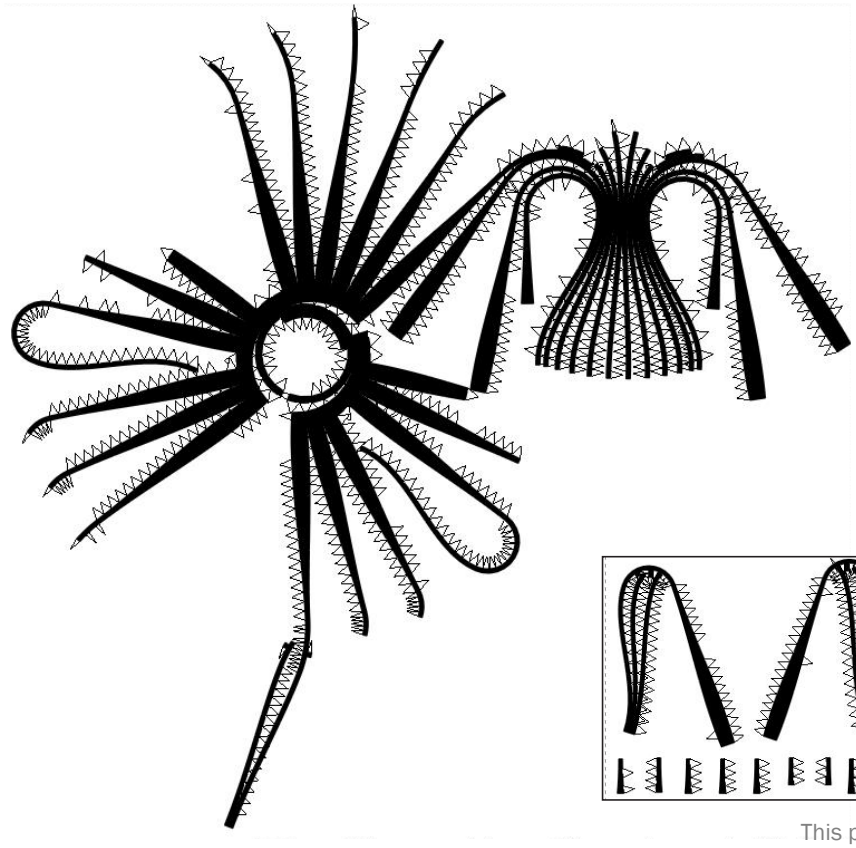
The shared goal of both studio projects was to link material and informational systems through reclaimed materials, digital fabrication and shipping logistics. This helped us both to establish and creatively respond to key issues and limitations within these 'components' (materials, tools, and information), and to begin experimenting with the ways in which such components might differently inform each other. The next phase of work sought to further accelerate these links and embed digital information in the material systems such that relationships between inputs and outputs were perpetually linked. This had in mind a future Internet of Things[21] context for future work; in which human, material and digital intelligence inform each other rather than remaining separate systems. For example, as the material fragments we reclaimed were coded, tagged, digitised and catalogued, they could then be scripted at a variety of scales – as sheets, components, assemblies or at other scales or units. A new variety of assemblies could be produced, with new uses, combinations of materials, scales of work and types of integration across sites and authors.

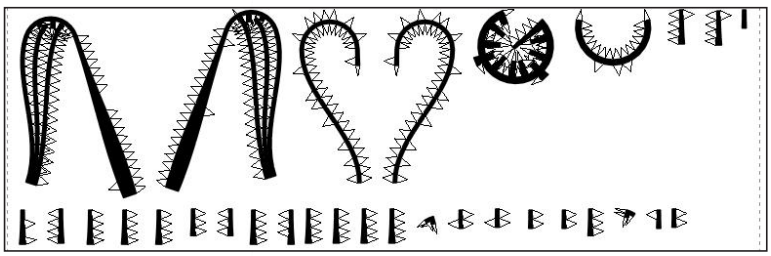
21 The Internet of Things refers to the increasing integration of physical objects with digital sensors and actuators so that objects are controllable remotely through internet-based technologies.



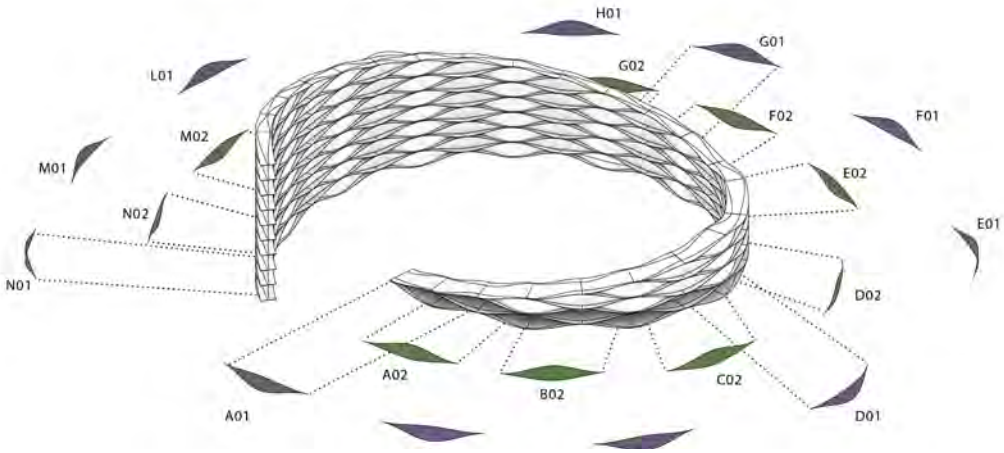
'unfolding' forms
(student:David Christiansz)



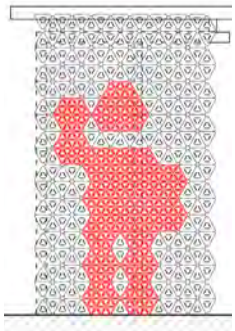


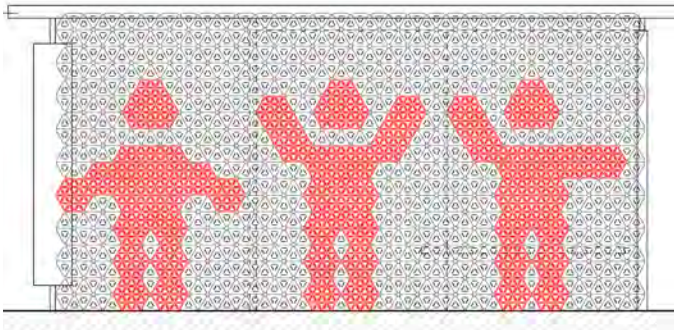


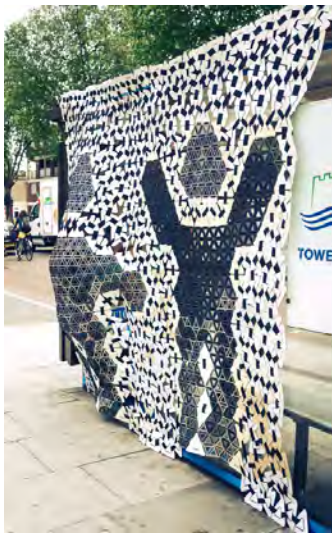
This page: 'unfolding' forms (student:David Christiansz)

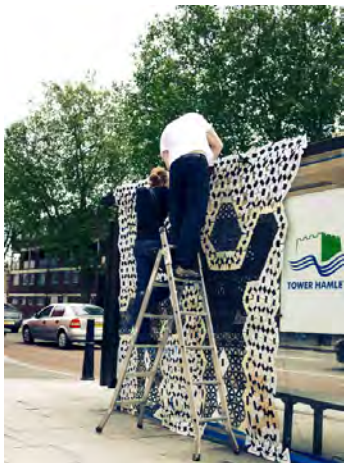


Wave Wall Project: (students: Shazilly, Sainsbury, Heron, Yong, Mak, Ting, Qin)









Softcore Project : in London
(students: McGuire, Wright, Perera, Macleod, Maehr, Chan, Li, Ting So)

Shifting craft upstream

One of the larger realisations of the experiments combining harvested materials and digital fabrication techniques was how well-suited this kind of design labour was to student-driven research in an educational setting. The material costs were nil, and the skill and craftsmanship typically required in full-scale construction (i.e. cabinetry), became transferred to processes of scripting and unfolding. At the same time, these phases of the design, while predicated on processes of automation, require a high degree of experience and fine-tuned adjustment. Programs like Grasshopper helped to accelerate the learning curve for design-based scripting, but it was the combination of such a softwarised[23] skill and its repeated material testing that truly revealed the capacity of these tools in use together. Thus, students practiced their craft at the digital phase, which is simultaneous to and embedded within the construction phase. The specific pedagogical value of this research was not in making constructions or learning to script form per se, but in developing a material intelligence that could bridge between the processes of input and output, between digital and material systems. In this context the studio operated somewhere between a research lab, a professional office and an artist apprenticeship, where students were both guiding the work and following where it led them.

Secondly, by focusing on the interface between digital and analogue systems, it also became clear to students that their work was being undertaken in the context of environmentally sustainable practice communities, even if this was not expressly the opening agenda of their research. This was evident both through the incorporation of reclaimed material and in closing the gaps between materials and fabrication primarily, but also in looking toward the efficiencies of international shipping and distribution – all of these systems being inherently embedded in both the built environment and contemporary architectural practice. The next phase of this research was undertaken not through design studio pedagogy but as a design submission for an ideas competition (Snap School – next). This was an opportunity to combine ideas of unitised building systems, industrial fabrication techniques and flexible approaches to site in a speculative project for contemporary educational teaching spaces.

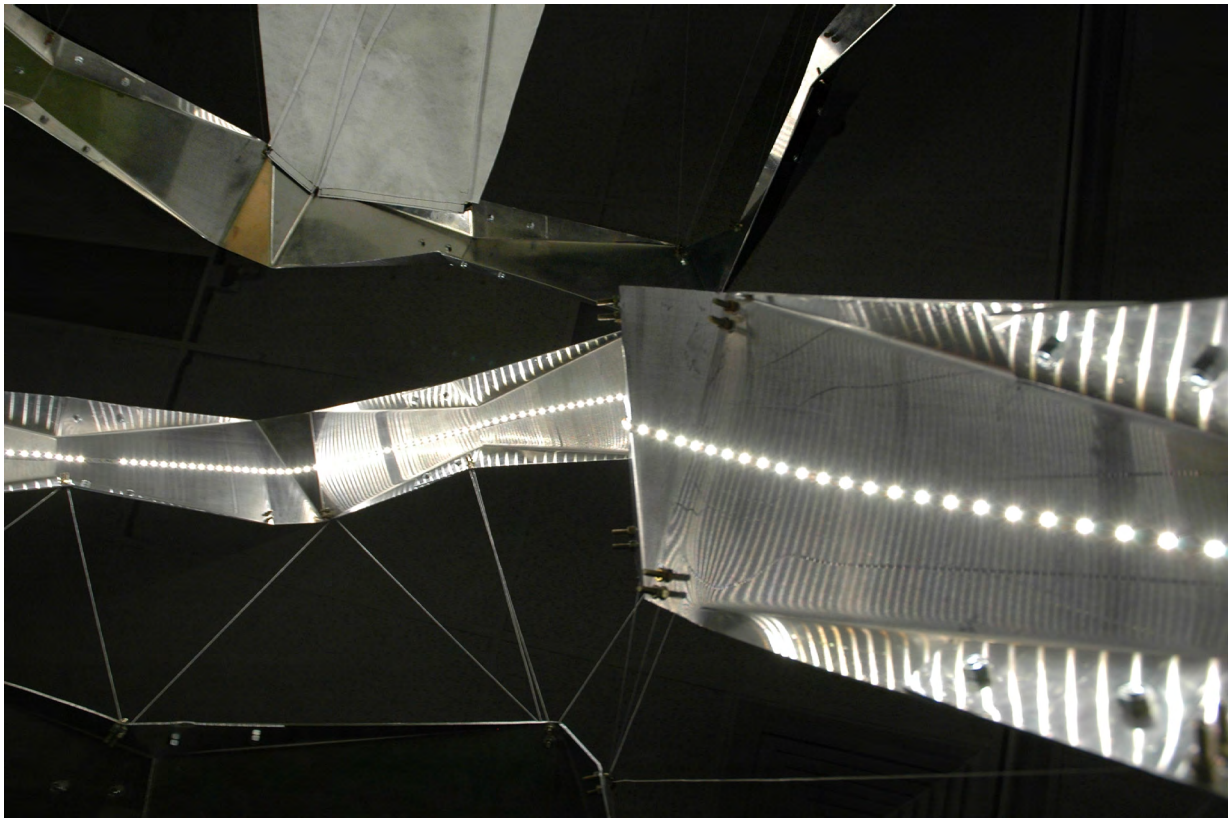
"The industrialized machine that displaced the physical labor of the human body is now being developed as an intelligent machine that displaces the labor of the human mind. Risk is still associated with human input but shifts from the hand (with industrialisation) to the mind (with computation)"

–Scott Marble (22)

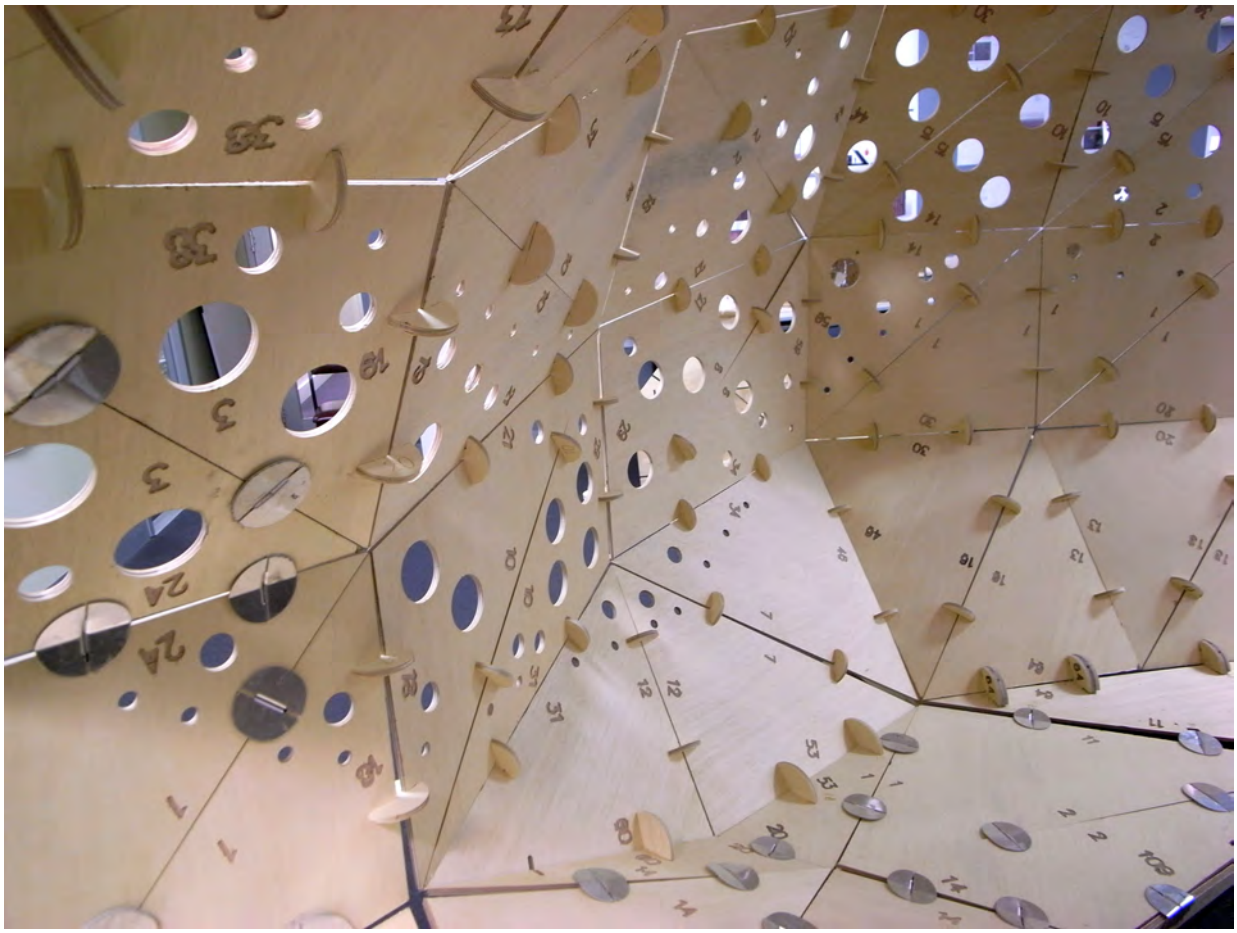
22 MARBLE, S. (2009) 'Imagining Risk', in *Building (in) the future : Recasting labor in Architecture*, P. Deamer and P. Bernstein, eds. p42.

23 MANOVICH, L. (2008) *Software Studies* accessed 11 August, 2012. <software**studies**.com/softbook/manovich_softbook_11_20_2008.doc>

Sliceform Project: in Melbourne
(students: Barzel, Forget, Kulatunge, Litera, Lucas)



Aluminium Project: (students: Mitra, Rossetti, Stafford)



Plywood Project: (students: Chisiza, Collins-McBride, Feggans, Holmberg)

2. Snap School

The Snap School was a design entry for the Future-Proofing Schools competition sponsored by the University of Melbourne.[24] The brief for this competition called for ideas appropriate to the design and construction of relocatable classrooms in Australia. Taking lessons from automobile and pre-manufacturing techniques, our proposal was designed as a platform with a series of customisable options. The basic unit was designed as a wedge-shape monocoque system with electrical, plumbing and air services embedded. This allowed the units to 'snap' together in a variety of configurations, allowing adjustability to various site conditions, school sizes, changes in educational or architectural program brief, or other variables specific to the school environment. The shell platform could be customised by each school or purchaser through an online interface. Users were able to 'build' the classroom online by selecting the size (number of units) and specific programmatic requirements, as well as options for colour, logos, branding or sun shading assemblies or other options.

Two unit types were designed, a basic unit that allows for general-purpose classroom use (discussion, lecturing, art), and service 'cores' that could be added to any unit for wet or specialised functions such as toilets or kitchen equipment. Each unit was based on a 1.2 metre sectional unit, which when combined could form larger patterns of classrooms, such as a zigzag shape, internal courtyard or series of linear bars.

The flexibility of the units was intended to provide an environmental and economical alternative to the inflexible, cumbersome and uninspired demountable classrooms currently in use. The units could be replaced or exchanged, returned to the manufacturer, or recycled/refurbished back into the inventory for use by others. Whether designed all at once or adapted over time, the system endeavoured to allow flexible response to site, local identity (external colour, pattern, etc.) and programmatic changes over time.

Once ordered, units could be shipped to the site and quickly assembled, snapped together and connected to local infrastructure. Site adjustments through a series of 'centipede' legs – adaptable to rural or urban sites – could be raised off the ground at any level for flood or grade changes. The adjustable feet and demountable awnings providing further site responsiveness, exterior program and climate conditions. The classrooms can be spaced apart to allow for external break-out spaces, circulation, or outdoor classrooms.

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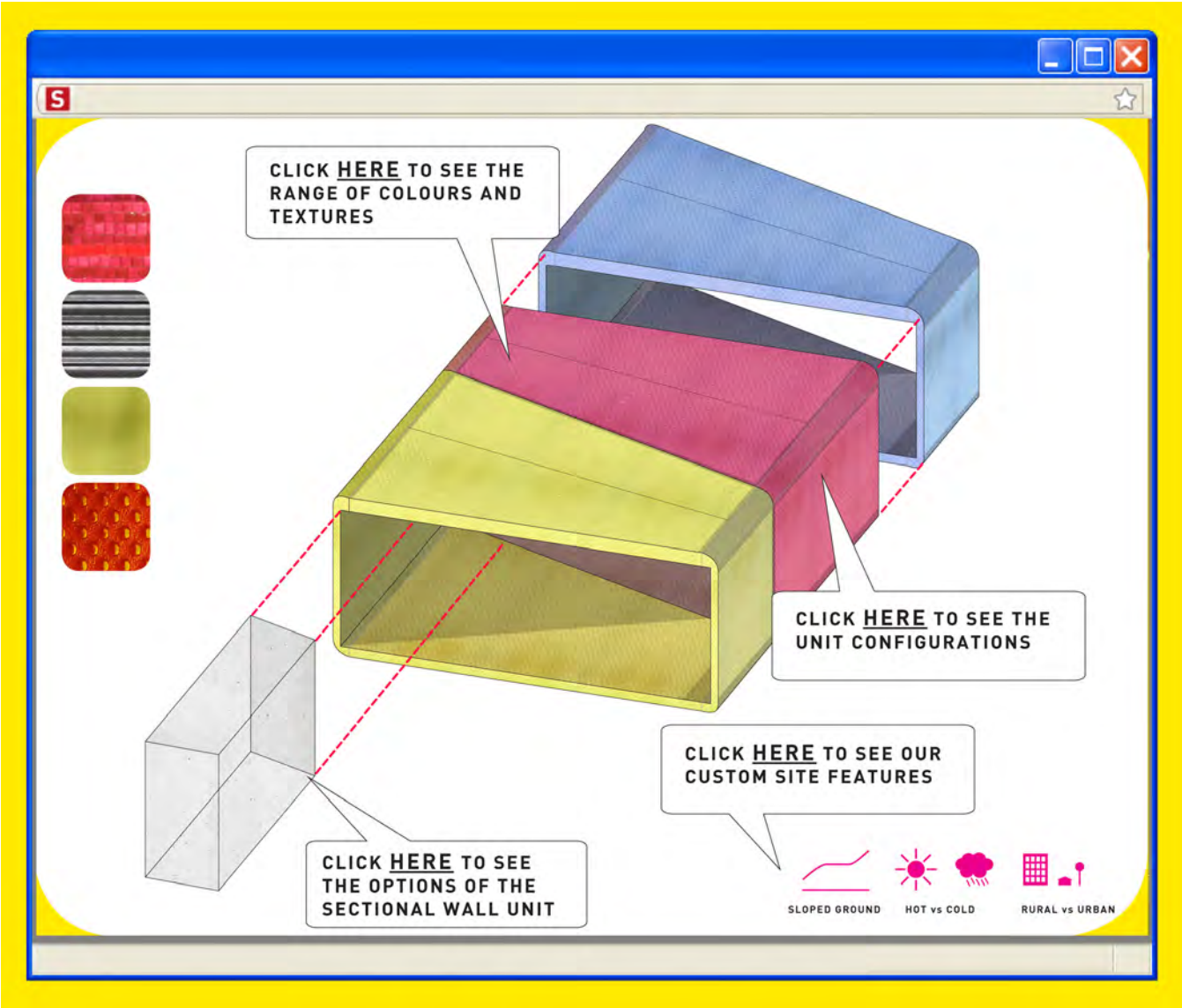
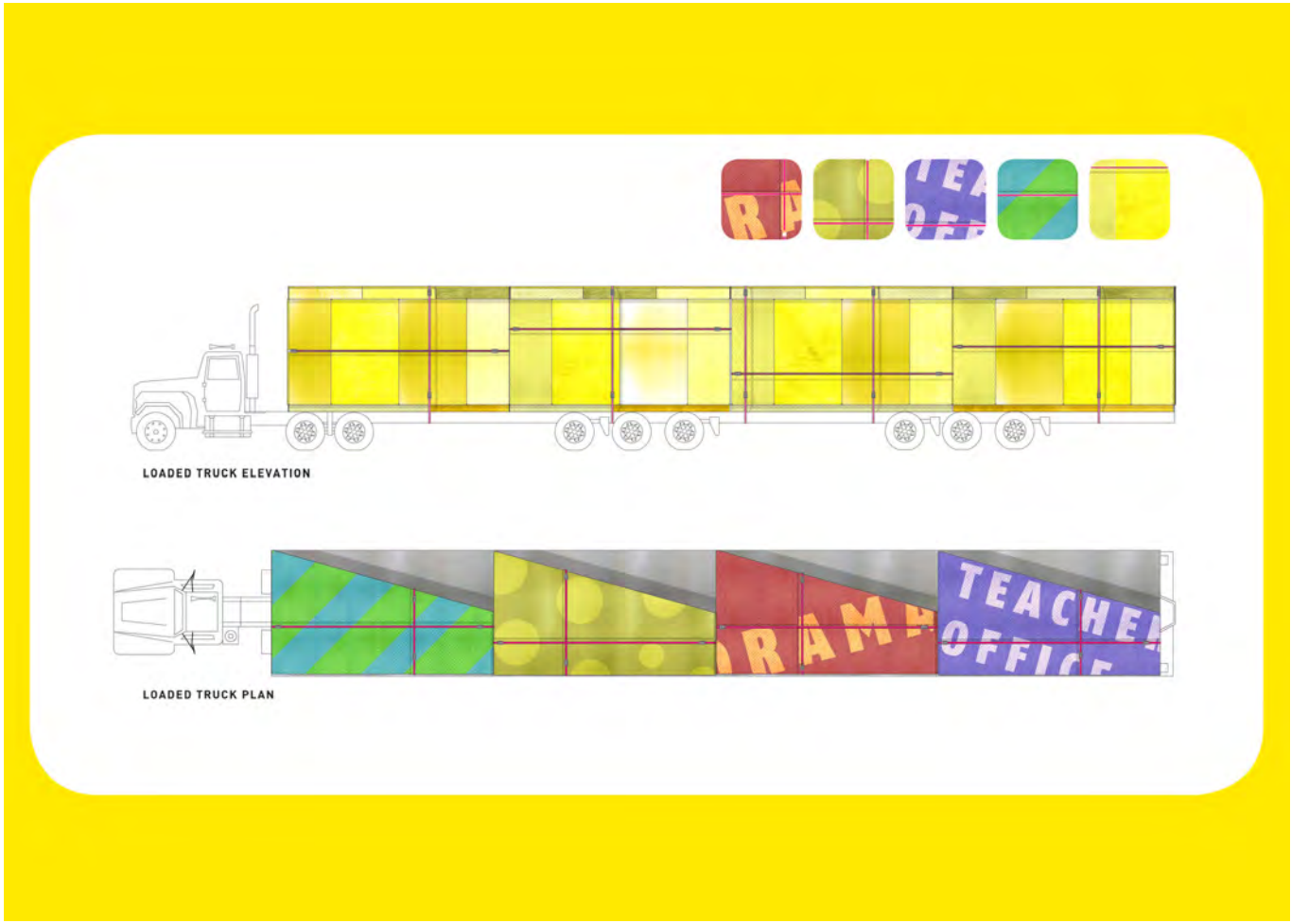
24 WILKINS, G., ZILKA, L., CHERREY, J., BODEN, T. (2011) 'Snap School' entry for the Future Proofing Schools Competition by the MSD Incubator at the University of Melbourne.

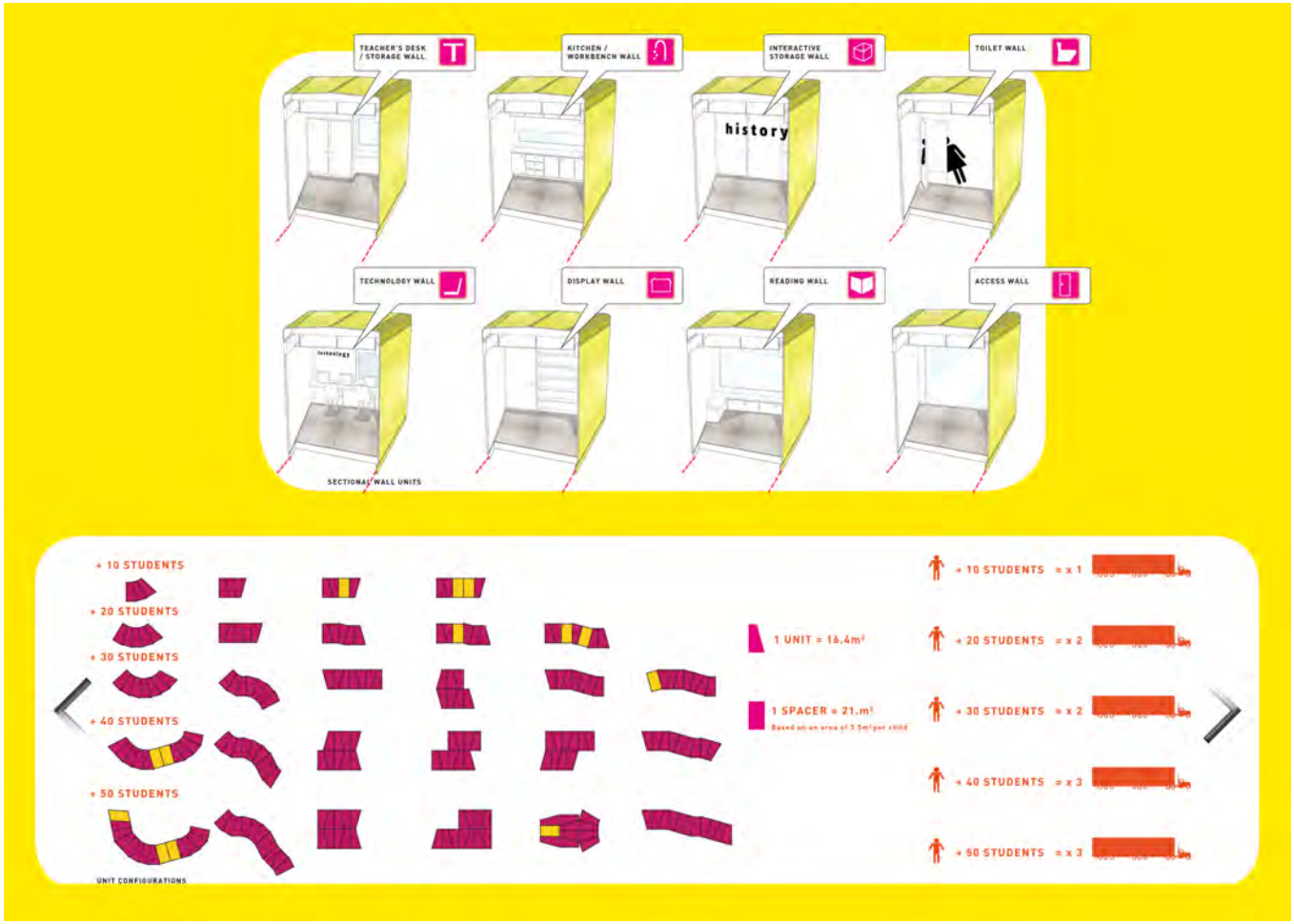


Snap School units (and website interface)

In summary, the Snap School was an experiment in applying industrial techniques to an architectural proposition. The monocoque system enabled interchangeability of components and customisation of the exterior, as well as responsiveness to variations in site and program. The online interface extended the design process into the user's realm, creating a small design network that linked architects, users and fabricators in an ongoing process of design, adaptability and construction over time. The project was an extension and integration of many issues raised by the research in this chapter. It sought to engender flexibility through the constraints of a simple, prefabricated building unit in terms of spatial configuration, site, use and aesthetic concerns. This was further extended to the client through the online interface and user-generated outcome. It explored the architectural opportunities inherent to industrial manufacturing techniques, and began to consider the next phase of that research, which includes the linking of digital information with material systems.



Snap School distribution



Snap School configurations

Conclusions

Sanford Kwinter is referenced here and in the opening quote to this document, for his evocation of Buckminster Fuller and his impact upon future perspectives of design – as a concept and as a way of thinking. The influence of Fuller in my own practice and research, reflected upon in this PhD, is for me both obvious and latent, fully absorbed and yet difficult to pinpoint. His legacy offers a deep well of ideas that this work visits repeatedly. In particular, Fuller's emphasis on the systems through which design is materialised, and how altering, tweaking or retooling those systems impacts larger design outcomes (even, in his case, whole cities) is a primary alignment to the practices that I am writing about and reflexively documenting here. Working outward from small and deceptively simple details and processes, whole systems and related practices begin to emerge. No universal approach to system(s) is a driver in my practice, rather the focus is more on offering up approaches to models that are capable of reversing or inverting conventionalised design thinking, in order to proceed from the inside out. This approach process is well-aligned with projects that begin from under-resourced, abject or otherwise limited possibilities.

"Of what other designer can even the following type of statement be said: He saw the automobile industry as a comprehensive challenge to the sociology of design?"

– Sanford Kwinter (25)

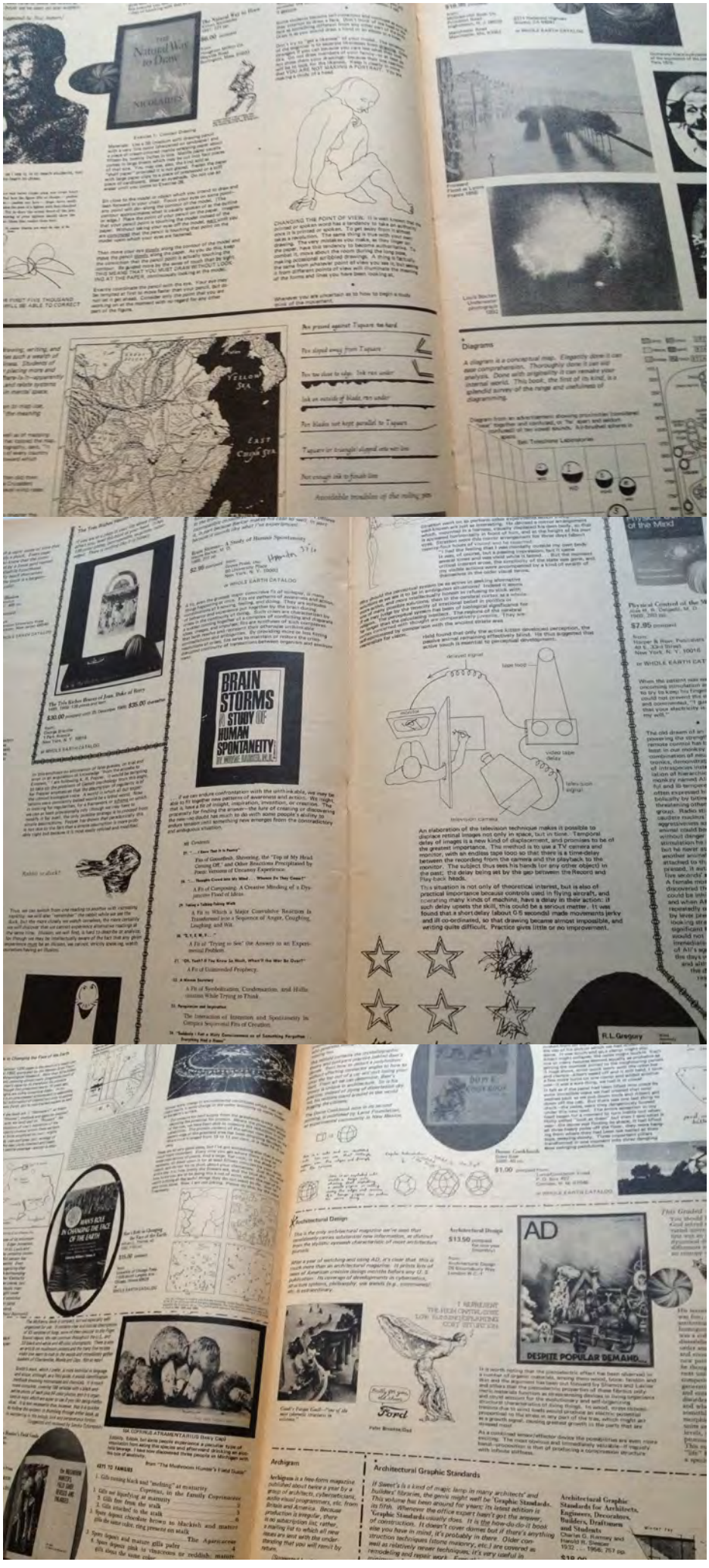
For example, discussion of design being able to produce 'something into nothing,' articulated in the introductory essay, prioritises a focus on starting from what is immediately present rather than what is absent, adaptation rather than pure conception. This agenda seeks to establish agency beyond the limitations of what is immediately available or known, but the starting point is tangible rather than abstract. This approach may appear on the surface to run counter to the discussions of utopian thinking in Chapter 2, wherein bold and idealistic imaginings are offered as a way to trigger real world experimentation and ambition. However, those imaginings are still an extension of what is known, an extreme speculation along the continuum from today into the future. The approaches here are similarly about accelerating ideas or artefacts beyond the limits of the immediate.

The prison-based art practices, urban material-scrapping and international waste-trade are all examples of this. In my work, the Fab-Pak project is an example, it framed architectural design and teaching processes around that approach by interrogating the limitations of laminate material, international shipping logistics and available material (waste) for new purpose. The Snap School competition pursued a slightly different trajectory, focusing not on limited resources or residual material but on the unit (a detail) as a starting point for the proliferation of variation. In both cases the value of the process can and should be measured terms of immediate outcomes – as urban furniture

25 KWINTER, S. (2008) P61.

projects and demountable classrooms in their own right – but they can, and should also be measured in terms of the broader socio-economic impact, such as educational value (in prisons and schools alike) or environmental impact of repurposing waste material. How, and to what degree the research documented here achieves those broader socioeconomic goals is a future trajectory for this work. At this stage of the goal has been establishing an agenda and conceptualising the opportunities afforded by testing and accelerating limitations of resourcefulness for architectural practice, in both material (1:1) and urban scales.

This approach is particularly informed by engagement with the automotive industry, the context of Detroit and experimental manufacturing processes, and by early interests in Henry Ford and Charles and Ray Eames. The impact of Ford's work on my own is, perhaps like Fuller's, difficult to quantify. The city that emerged, and declined, around his industry is inseparable from any discussions in this work about manufacturing, urbanism and the design trajectories which link them. The architectural developments that have resulted from shifts in the way cars are made, for example, significantly influence my approach to design, and views on urbanism. The shift in Detroit from the vertical assembly line to the horizontal assembly line to roboticised, distributed assembly network is one example. Charles and Ray Eames' experiments in laminated plywood, furniture manufacturing and adapted technologies during WWII, are an equally present influence on my practice and teaching. Their approach to practice in general, one that operates so intensively and prolifically between so many ideas, outcomes and scales of work, offers a very useful and inspirational model. Theirs is a form of practice predicated on experimentation across many platforms while remaining committed to producing for clients and the public alike. This resonates with the discussion of expo buildings in Chapter 2, as experimental constructions in and for the public realm, prototypes for future technology and urbanism tested by the public. The approach to networked practices and the model for future practice discussed in the next chapters learns much from these precedents, especially the investment in making, experimentation and collaboration with industry.



Pages from the Whole Earth Catalog (1969)

Chapter 5: Networked Practices

Access to tools

"The new (operating system) is neither the classic communism of centralized planning without property nor the undiluted chaos of a free market. Instead it is an emerging design space in which decentralized public coordination can solve problems and create things that neither pure communism nor pure capitalism can"

– Kevin Kelly (1)

Overview

This chapter discusses the space of my practice emerging between the paralleled interests in industrial manufacturing and contemporary urbanism, the 'third space' discussed in the Introduction. The work presented here sits at the core of this PhD research and marks a pivotal point in the process of reflection undertaken during this period. These streams introduce the key drivers for the projects and approach described here. One of those drivers is the relationship between distributed and local practice; including networks of practice,[2] and intersections between local and remote sites, virtual and physical space and digital and tangible media. A second is assessing the structure of authorship in creative practices, which ties directly to the discussion above on networks and distributed design. This chapter presents an argument and proposal for the incorporation of collective production in architectural practices, highlighting the importance of end-stages of design and of retaining 'gaps' within project and practice structures. An introductory text frames and elaborates these ideas in the context of design practice generally. Then four projects evidence this approach in my own work, undertaken through design, writing and teaching. This chapter also establishes the framework and agenda for the future practice model, discussed in Chapter 6.

1 KELLY, K. (2009) 'The New Socialism: Global Collectivist Society is Coming Online,' in *WIRED Magazine*, Vol 17.06, p120.

2 The use of the term network is vast, this work specifically focuses on physical-digital connections, and local-remote sites. It is informed by much writing on the subject, such as Mark Wigley's essay "The Architectural Brain."

The agency of incompletion

The space of practice that emerges in my work between the poles of manufacturing and urbanism is not well defined. This partially attributable to the status of this space as a new territory of practice; it is impossible to fully know or delineate *just yet*. At the same time however, the indeterminate quality inherent to this (or any) nascent design practice is, in fact, the key driver of work here; incompleteness and open-endedness are pursued deliberately as productive drivers for creative design practice. To actively resist completion is to acknowledge that this territory of work is not well defined *by nature,* and therefore may not become neatly delimited or defined by an encompassing strategy ever, over time. Indeed the value of this approach is predicated on maintaining the opposite attitude toward comprehensiveness and closure.

This approach builds on ideas elaborated in chapters two and three, including Gibson's description of the perpetually innovative and 'uncooked' city, and Brian Massumi's discussion about 'creative incompletion' in architectural design process over time. It also builds a temporal orientation towards the productive unfinishedness of cities, reflected in Lim's argument for 'incomplete urbanism' or the 'long-revolution' of Harvey's dialectic utopianism. These approaches all point toward a position in which resistance to completion, or incompleteness, is not only creatively productive but also vital; it encourages the continued propagation of ideas, types of work and forms of practice.

The benefits of this approach often appear more clearly when viewed from a retrospective position rather than as a proposition for future creative practice. Tracing the lineage of an idea to an artefact, or locating critical moments in a design process, for example, will often reveal the gaps and blind spots that weren't visible at the time, but which later proved instrumental to the project's success. Structuring a practice or specific projects explicitly around such gaps, however, or depending in some way on their presence and agency in advance, is challenging at best, paradoxical at worst. That is to say, it may be argued that 'creative incompletion' is an intrinsic, spontaneous characteristic of creative process and therefore antithetical to design in advance (i.e. you cannot plan for unintended consequences). We might recall Harvey's problem of 'closure' in utopian projects discussed in Chapter 2 – in which the promise they offer is diminished by either too much of closure (literal formalisation) or not enough (laissez-faire) as an example. Is it possible

to structure a model of practice that achieves the benefits of both incompleteness and completeness, and if so, what would it look like? Looking more closely at the structures of authorship in creative, innovative work can provide some clues.

The dilemma is that completion is both essential for and antithetical to innovation; and, that incompletion is inherently informed by its opposite. Unlike invention, or discovery, which reveals new things were not seen or understood previously, innovation is predicated on previous works and perpetual production – new ideas, things or methods emerge from existing (i.e. completed) ones. Yet innovation is by definition also concerned with continuous transformation and change, in which case nothing can be taken as fully, terminally finished, and everything becomes source material for further development. Intensive, individual work is critical, but so is the external, equally autonomous work of others in response, or as a provocation. This is distinct from a design by committee model, which allows many authors but effectively operates as a single body, or from a collaborative of individual practitioners sharing a common identity. Rather, it is a model that enables autonomy and collectively to coexist toward a common agenda if not an actual project, the form of which is necessarily indeterminate.

Open-source platforms, for example, are predicated on discrete, individually authored units of work within a collective environment. This structure is well aligned to that of innovation generally, in that it maintains the benefits of having many minds and hands at work towards a common goal while avoiding the dissolution of authorship to a group(think) scenario. Open-source platforms invite multidisciplinary approaches to a project, encouraging eccentricity and contrast over uniformity and cohesion, and operating 'automatically' in the sense of voluntary and open-ended participation. This also makes them less predictable or stable, leading as often to junk as to substantive outcomes. As Kwinter has remarked, "instability, it turns out, is the precondition of creativity."[3] It might be said that instability is a precondition of any 'creative incompletion,' insofar as the gaps between dissimilar approaches, knowledge or perspectives trigger multiple future trajectories to the work, while equilibrium tends toward uniformity and resolution, or being 'cooked.'

3 KWINTER, S. (2008) 'De L'Audace' in *Far from Equilibrium: Essays on Technology and Design Culture*, Barcelona, Actar Press. p16.

Unlike so many other disciplines, however, collective authorship and deliberate strategies for 'creative incompletion' in architecture are not immediately obvious, applicable, or widely taught. Indeed the strict regulatory, legal and financial conditions through which the profession and industry operate all but disallow it. This does not mean there is no place to rethink these principles however, or that methods of doing so are already prescribed elsewhere (open source platforms in computation, for example). The challenge for architecture is to structure a way in which completion perpetuates production rather than terminates it, to allow multiple 'completions.'

Endgame

Perhaps, ironically, the best way keep things unfinished is to get them done. If being 'done' can be defined more in terms of future potential within the work and not a termination of it, then 'done' becomes a strong inflection point and not an expiration point. In this sense, being done is an indication of the most productive or actionable point of a project rather than the most perfected or comprehensive one. With regard to design practice, the ending stages of a project become a key focus, but these need to be considered (and designed) not as conclusive but expansively. This might imply letting-go of or releasing work earlier, such that multiple outcomes are (still) possible, enabling contingency,[4] or embedding mechanisms through which others may 'complete' the work. The general idea is to strategise the endgame of design in order to trigger multiple future openings. Perhaps, in that case, rather than 'creative incompletion' the term 'creative completion' works just the same.

Collective systems of design are remarkably conducive to innovative practice because they provoke unintended consequences *by nature,* rather than leaving things to chance or attempting to predict them. If the endings, or end-strategies, of projects are designed to anticipate or encourage future work, then incompletion and completion might coexist as 'two sides of the same coin' strategically as well as incidentally. This is distinct from crowd-sourced or open-sourced processes in computation although it takes much from those principles. The aim here is to maintain control over a (relatively) complete piece of work while instigating a next phase, rather than situating design within a fully open or perpetually adjustable system. Completion is still important, but it is repositioned in terms of continuation. Getting things 'done' becomes vital precisely because it allows more to be done.

4 Refers to Jeremy Till's discussion on architecture and contingency in: TILL, J. (2010) Architecture Depends, Cambridge and London, MIT Press.

Projects: Between virtual and actual

As a way to elaborate upon this conceptual framework of networked collectivity and incompletion this section presents four projects. Each captures an experiment with collective approaches for architectural practice undertaken through design, teaching and writing.

The projects are:

- ***Distributed Urbanism: Cities after Google Earth*** (publication: editor and contributor)
- ***Passport*** (drawing project: author and curator)
- ***TankView*** (design project: co-author)
- ***Google Cities*** (architectural pedagogy: author and instructor)

1. Distributed Urbanism: Cities after Google Earth

"Cities are the largest technology we make"

– Kevin Kelly (5)

Distributed Urbanism: Cities after Google Earth (2010) is a publication I edited and contributed to that emerged from a symposium and architectural workshop in Detroit entitled *Borderlands (*2007). The symposium invited architects, academics, artists, industry and government representatives to offer new perspectives and design approaches for the increasingly indeterminate spatial conditions in Detroit. The publication then extended this discussion to contemporary urbanism in general and the forces at play within it, inviting twelve authors to provide case studies from various cities or situations around the world. These included Beijing, Mumbai, Rotterdam, Dubai, Hong Kong, Tokyo, Detroit, New Orleans, Arequipa and other cities.

My introduction (written as the book's editor) established a framework for considering these essays in a collective and comparative context, as well as in terms of the broader networks of information implicated in contemporary urbanism. An excerpt of the introduction is useful to include here, articulating the ambition of the book itself as a project within this doctoral work, and also to foreground relationships between urban and industrial practices, and virtual and physical space. This excerpt also works to introduce the projects in this section that follows, which pick up on and further develop ideas initially curated in through the *Distributed Urbanism* project.

5 KELLY, K. (2009) 'The Choice of Cities', *The Long Now Foundation*, viewed 19 March 2011, <http://blog.longnow.org/02009/07/06/the-choice-of-cities/>

In April 2009 Mark Zuckerberg announced that Facebook, the social networking website he launched in 2004, had amassed 200 million users.[6] To demonstrate the significance of this figure he contextualised it within global demographic data, for example how long it took the world to amass 200 million people (20,000 years), how it would rank in size as a country (fifth, bigger than Japan, Brazil and Russia), and the distribution of users geographically (the highest concentration of 90 users per square mile in parts of Canada and Europe is greater than the average population density of the United States). Ultimately Facebook is simply an interface through which to exchange digital information across the web, like any other of its kind. Yet, positioning the site in a demographic context makes more explicit the ways in which this network connects to others outside the digital realm, where it is then used as a tool to "make a difference" locally through political advocacy, emergency response[7] or public health.[8]

The distributed nature of social networking follows the general trend toward distribution of everything, everywhere, from automobile production to energy collection, social services to citizenship, news media to professional sports, all of which having to some degree relinquished a model of singularity and centralisation for one of multiplicity and interactivity. The connectedness of places and data has increased exponentially over the past decade or more, and will likely continue to do so. The endgame of this progression is what MIT is developing as the Internet of Things, an environment in which the web is the primary operating system for all things material and digital, actual and imagined, and everything is ultimately interconnected through sensors and computers. IBM inventor Andy Stanford-Clark created his own Internet of Things by linking Twitter feeds to household objects, or "tweetjects," which allow him to remotely monitor and interact with his house, saving thirty percent in energy consumption.[9] These increasingly complex relationships between distributed networks and local conditions have shifted social, economic and environmental practices, and the practices of architecture and urbanism are no exception.

The distributed mechanisms shaping cities tend not to be discipline-specific, nor are the tools we use or more often adapt to design, perceive, and inhabit them. This is why it is not far-fetched to speculate on how networks like Google, corporations like General Motors, or sites like Facebook, affect contemporary urbanism.

Distributed Urbanism marks a moment when tools like Google Earth indicate a much broader transformation in integrative design, when environments are shaped from the outside in and the inside out. The integration of the trailing bits of information produced by others, and digital residues that proliferate exponentially, suggest a resilient form of practice that takes place locally and remotely, collabor-

6 ZUCKERBERG, M. (2009) '200 Million Strong', The Facebook Blog media release, weblog, accessed May 2009, <http://blog.facebook.com/blog.php?post=72353897130>.

7 New York City Office of Emergency Mangement (2009) 'Office Of Emergency Management Launches Official Facebook Page To Promote Emergency Preparedness', media release, accessed 16 June 2009, <http://www.nyc.gov/html/oem/html/pr/09_06_16_facebook.shtml>.

8 Mapping the Swine Flu Discussion' (2009) A Facebook page evolves, April 29, 2009, accessed 20 May 2010 <http://www.facebook.com/album.

9 STANFORD-CLARK, A. (2009) 'Things I've done', Media Release in *WIRED Magazine*, TED Global talks, accessed May 2009. <http://www.wired.co.uk/news/archive/2009-07/21/how-to-make-your-house-tweet---and-why.aspx>.

atively and concurrently. In this context the boundaries of the discipline expand to include digital, physical and social networks well beyond those specific to design. As the tools producing the "New [digital] Socialism" are extended to architecture, and architecture to them (i.e. Google SketchUp[10]), does architecture become an open-source discipline, a collectively designed and fabricated? The effects of digital fabrication technologies and robotics are not addressed in this volume but are clearly part of this discussion at the scale of materials and construction – allowing remote control of architecture in a manner the medical sciences employ at the scale of the body. As the tools of architectural production are increasingly integrated with those of cultural production the discipline of architecture is poised to reassert its relevance across a much broader territory of design and making.

(May, 2010)

Cover of Distributed Urbanism: Cities After Google Earth

10 Trimble Navigation and Last Software (2000) SketchUp Digital Modeling Software [(Computer program)]. Acquired by Google in 2006. Available at http://sketchup.google.com/ (Accessed 1 August 2012).

The *Distributed Urbanism* publication introduced many issues that were later expanded through research. The relationship between emerging collaborative tools and distributed practices is one of those issues, which relates both to Google as an information resource as well as Google Earth as a virtual spatial realm. These issues form the basis of the premise for the *Google Cities* architectural coursework described below, which was a combination of design studio and research seminar exploring the implications of these tools for architectural practice. The second issue relates to Google from a historical perspective, and questions around contemporary design and communication tools. The proliferation of both digital (programs) and physical (fabrication) tools has dramatically impacted upon and will continue to affect architectural practice.

The increasing integration of information into materials and design production tools is one outcome of this shift. More comprehensive platforms are a result, such as tools or building information models (BIM) which can account for multiple variables of a project, thereby reducing gaps, and risks. However, an alternate outcome of this progression, and one aligned with this research, might be that the multiple, dispersed new tools can productively introduce, rather than ameliorate, gaps (and risk), enabling more sophisticated platforms for collective production in architectural design. It is an inverted understanding of the possibility of networked production, focusing on the agency of the gaps instead of the redundancy of the links. This advances models of 'creative incompletion' as described above, wherein discrete components of individually authored work contributed to a collective agenda, project, or practice. The question in this case highlights the significance of 'tools' in distributed networks of production, both architectural tools and those borrowed from other industries. Tools enable work to be done, but don't specify the outcome. The creative collection, curation and use of alternative tools shifts the focus of design and production from comprehensiveness to collectivity.

Top right: Whole Earth Catalog: 1968
Middle: WIRED Magazine 18.02 (Feb 2010) on contemporary manufacturing)
Botom: WIRED Magazine 17.06 (June 2009) including "The New Socialism" article

Access to tools

Technologist Kevin Kelly's article about the "New Socialism" (2010), a quote from which opens this chapter, lends an important insight and inspiration to the work emerging between industrial and urban practices. In it, Kelly argues that the types of collectivity being produced rampantly by and through digital culture are producing a new form of socialism. This is not an ideological or political socialism, "rather, it is a spectrum of attitudes, techniques, and tools that promote collaboration, sharing, aggregation, coordination, ad hocracy, and a host of other newly enabled types of social cooperation. It is a design frontier and a particularly fertile space for innovation."[11] The links of his argument to my own work are in how technologies influence and enable architectural practices to take shape in the space between industrial and urban processes (and in general), as well as impact the social and economic dimensions of such. Industrial manufacturing, which left such an indelible mark on the urban fabric of Detroit through various incarnations as vertical, horizontal and distributed manufacturing for example, is transforming yet again in the context of digital design technologies and (social) networking platforms. The connectedness of people and places, and the accessibility of technologies through open-source networks, means that nearly anyone can manufacture anything, anywhere. Further, the growth of small scale, personal manufacturing, such as desktop 3D manufacturing, robotics and remote fabrication has brought manufacturing back into the central parts of the city. The singular, massive factory is being replaced by many independent, small workshops, producing a network of production collaboratives with increasingly open access to tools.

'Access to tools' is the subtitle of Stewart Brand's self-published *Whole Earth Catalog,* (volume 1 in 1968 and periodically thereafter) for which Kevin Kelly was an original editor.[12] The first iteration of the Catalog was a publication of products considered useful 'tools' for sale, collected from a variety of sources with information about where they could be obtained. They were arranged into categories such as "Understanding Whole Systems," "Industry and Craft," "Nomadics," "Learning" and so on. In the first instance the project was conceived as a way to collect and disseminate tools which encourage self-education and self-sustainable lifestyles. The stated ambition of the publication was to "function as an evaluation and access device. With it, the user should know better what is worth getting and where and how to do the getting."[13] In order to be included the object has to be deemed: 1) useful as a tool, 2) relevant to independent education, 3) high quality or low cost, and 4) easily available by mail. The 125 original entries ranged from utterly pragmatic to esoteric, nonetheless linked by these four criteria. Readers were encouraged to review the tools, recommend new ones and share information with others.

11 KELLY, K. (2009) "The New Socialism: Global Collectivist Society is Coming Online" in WIRED Magazine, vol 17.06, June 2009. p118.

12 BRAND, S. (1968) *Whole Earth Catalog*, Published by Stewart Brand.

13 BRAND, S. (1968) *Whole Earth Catalog*, Published by Stewart Brand, p2.

A description of the Catalog is included here because in many ways it encapsulates and prefaces ideas about collective authorship and the agency of incompletion in ways which are transferable to architectural practice. The original project itself, produced in three weeks by a team of five people, was a prototype for many related iterations over the next thirty years. It was a finished project in 1968 and finished again in each subsequent version, each one responding to, reflecting on, and extending from the one before; it was both complete and incomplete each time. It was also a prototype for many contemporary tools of information across other media. Kevin Kelly has since reflected on the significance, and prescience, of the catalogue forty years later, by saying, "This was a great example of user-generated content, without advertising, before the Internet. Basically, Brand invented the blogosphere long before there was any such thing as a blog."[14] Steve Jobs has made similar remarks about its role in contemporary culture, suggesting it was Google before Google:[15]

The underlying ideas motivating the project are also significant: to collect information and useful tools, and to promote self-education and therefore, production, through collaborative yet distributed networks of people and information. The emphasis on tools makes this explicit; 'tools' offer the means for work but do not prescribe what is completed or how, therefore multiple future outcomes are possible. [16] Finally, the Whole Earth Catalog is also an example of an open-source type platform that accepts diverse and eclectic input from a range of sources, despite its analogue format. As such, it supports an equally diverse network and range of outputs.

14 KELLY, K. (2008) 'The Whole Earth Blogalog', weblog, accessed 17 September, 2008 <http://kk.org/ct2/2008/09/the-whole-earth-blogalog.php>.

15 JOBS, S. (2006) 'You've got to find what you love', Commencement address to Stanford University, accessed 14 June 2005, http://news.stanford.edu/news/2005/june15/jobs-061505.html.

16 The notion of 'tools' also refers to Charles Landry's discussion in relation to cities in *The Creative City: A Toolkit for Urban Innovators*.

The Whole Earth Catalog doesn't provide us with a solution or specific strategies for 'creative incompletion' and collective authorship in architectural practice, but it does lend a clue in considering the mechanisms for attempting such approaches. The Catalog's open approach to linking local and practical implements with global and 'virtual' distribution is useful, especially for my own considerations of contemporary industrial and urban practices. Increasingly open access to tools and abilities to collaborate across networks opens up increasingly expanded and exciting territories for contemporary or post-'mass,' production: small, local, distributed manufacturing. This invites new relationships between architecture, industry and the city. As a case study prefiguring this, the Catalog also lends insight into the infrastructures for designing a 'practice platform,' which will be discussed more in the next section.

The *Distributed Urbanism* book was for me an introduction to thinking about the relationship between digital and physical tools in the context of contemporary urbanism. This led to writers like Kevin Kelly and Stuart Brand, and early versions of distributed information and networked tools, such as the *Whole Earth Catalog.* The Catalog provided a framework through which to reread my work, as well as a framework through which future projects were established, including *Passport* and *TankView,* and especially the *Google Cities* studio, each described in detail below.

2. Passport

The *Passport Project* is a pilot project (or prototype) for collaborative practice, a test of multi-authored engagement around questions of contemporary urbanism, very broadly defined.[18] The aim of the project was to produce a global document in linear book form, comprised of discrete, individual contributions about contemporary urbanism, through drawings. The project was launched from Melbourne in June 2010 as a book and website, travelling around the world until March 2012. The format of the document, a linear double-sided, accordion-style book, was sent to 24 people in 23 cities sequentially, with the brief requesting 'construction documents for urbanism.' Each contributor, an architect, urbanist or artist, was given a two-page spread and two weeks to produce a drawing before sending the book on to the next contributor. The method of drawing was left open to contributors; the only stipulation beyond the subject of the brief was that the work was produced in the book provided, and must respond in some fashion to the work immediately preceding it. As such, the book progressed in an 'exquisite corpse' fashion, and became a volume that was both a series of individual, disconnected pieces and one collective work.

"If [the word] 'darkness' were taken through the languages of the world, translating from one to another in turn until in the end you returned back to English I wonder if you would return to 'darkness'."

– John Christie to John Berger, (17)

Beyond the immediate goal of curating multiple perspectives about contemporary urbanism through the medium of digital and physical drawing, a larger ambition of this project was to frustrate the relationship between design, representation and production. Positioning the project as 'construction document' relates to conventional architectural modes working, wherein design ideas are communicated schematically, then documented in a 'language' that is readable by those constructing the work. This consists of graphic and textual documents, as well as a series of contracts and specifications that guide and govern the process. Typically these drawings consist primarily of quantitative information, such as dimensions, types of materials, assembly instructions and so on. Qualitative information is embedded into these documents insofar as it was considered in the first place, earlier in the process. If, however, construction documents consist of primarily qualitative information and the quantitative results required interpretation, or translation,[19] a variety of physical outcomes become possible. Indeed, the physical outcome is effectively unspecified. Passport was an experiment with a document that consists of equal parts, or at least some deliberate combination of, qualitative and quantitative information, so that that it is translatable with some degree of predictability while remaining open to interpretation by others. It is a complete drawing that remains incomplete. It requires completion in two ways: in terms of the next drawing in the book, since each drawing was expected to respond in some manner to the drawing before,

17 BERGER, J. & CHRISTIE, J. (2000) *I Send You This Cadium Red: A correspondence between John Berger and John Christie*, Barcelona, Actar.

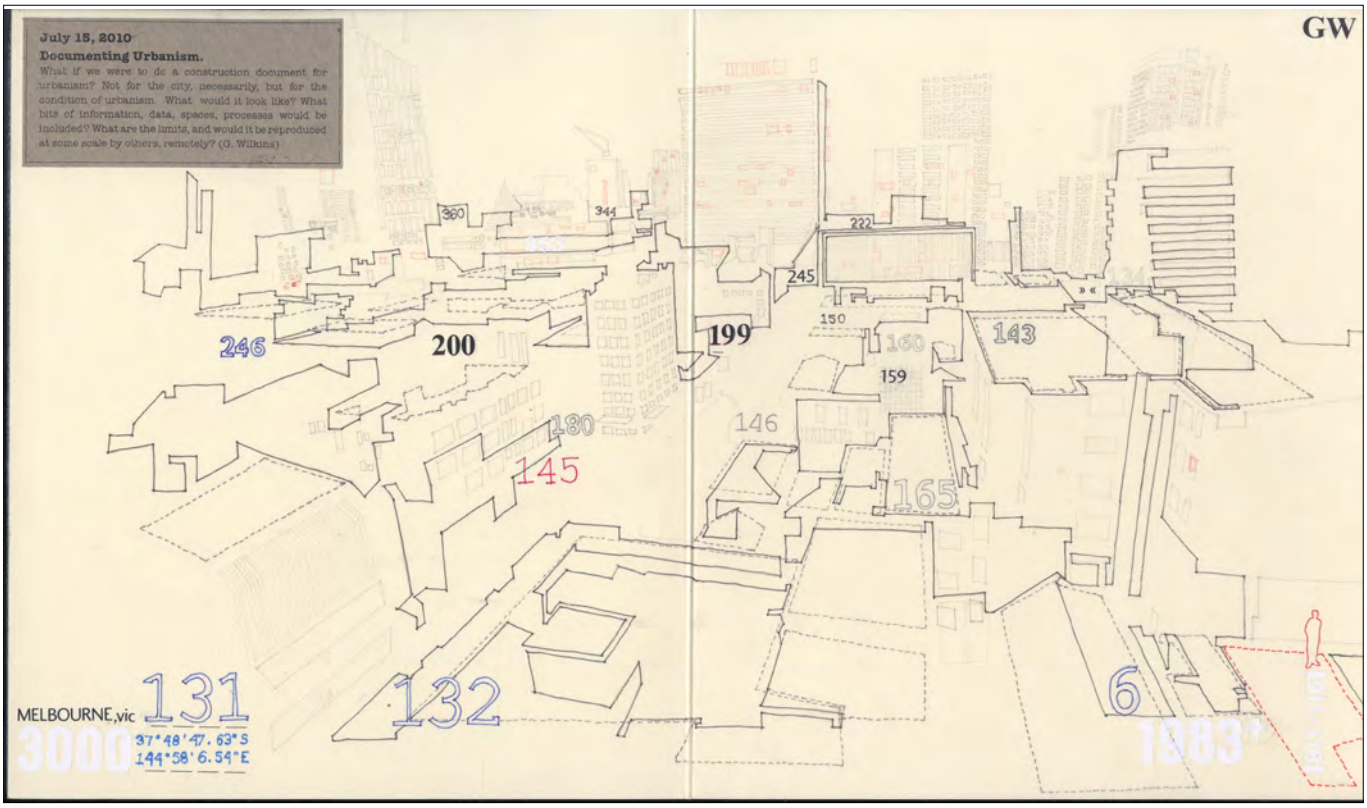
18 A link to the Passport website, documenting all the work, contributors bios and tracking, can be found here: <www.passport-projects.com>

as well as in terms of translation of the document as a set of instructions for physical construction in the world.

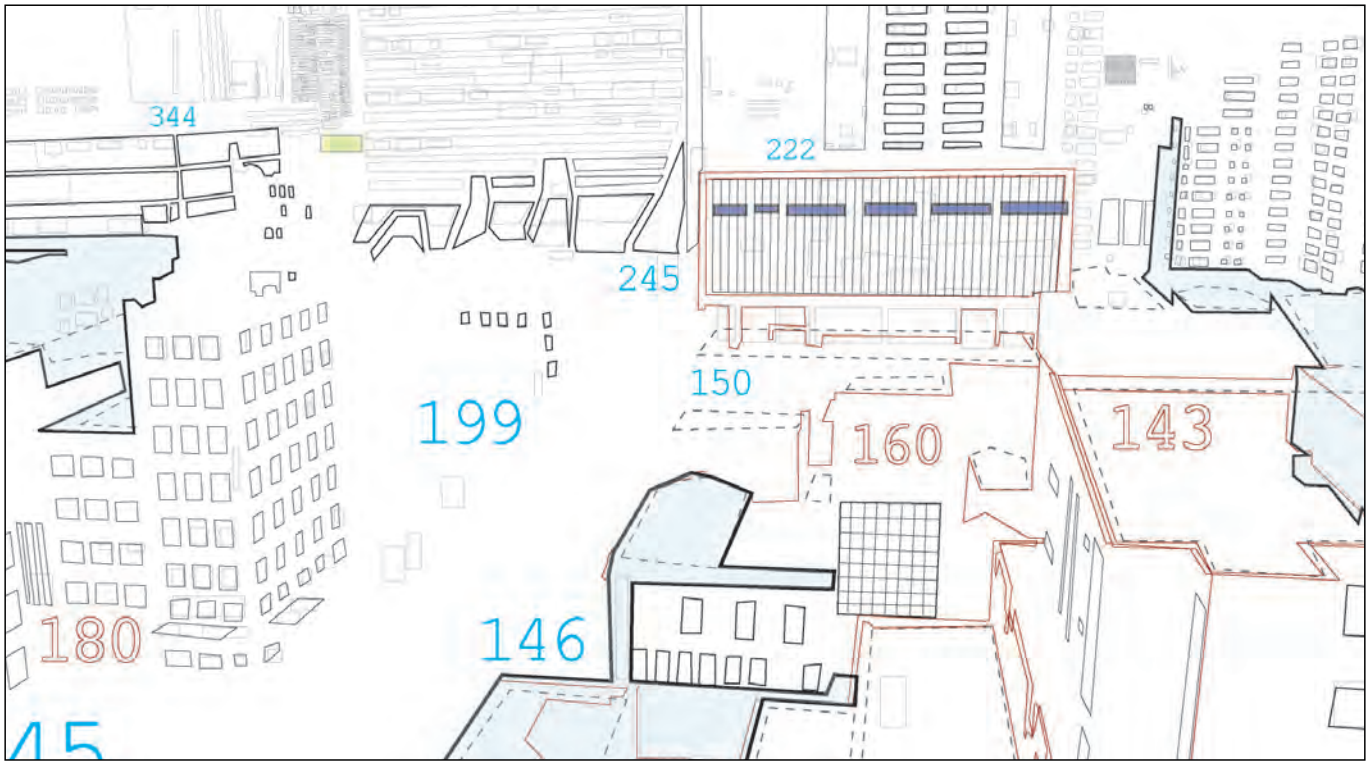
The international framework of the project adds another layer of translation. Each contributor was working from a different cultural context, and so each approached the question from an inherently different global perspective. Including a variety of cities ensured this difference, but many other factors contribute to the way cities and spaces are translated, represented, and then reinterpreted by the next author. Language is only one of these factors, as well as variations in architectural technique, ideas and pedagogy. The ideas represented by the authors reflect these variations, drawing urban conditions links particular approaches of observation, representation and translation. This is especially present given the qualitative emphasis placed on the project (as opposed to asking for measured drawings of cities). For example, cities were described through conditions of alchemy (Ann Arbor – Perry Kulper), anamorphosis (Pittsburg – Pablo Garcia); time (New York City – Moira Henry); 'war' (Johannesburg –Sarah Calburn); resistance (Paris – Mireille Roddier); childhood (Girona – Lluis Sabadell Artiga); and memory (Istanbul – Elif Kendir). Each work is inherently a reflection of the qualities and experiences embedded into their city historically, culturally and personally, but those qualities needed to be visually coded in such a way that they would extend outside of that intimate realm. They had to become abstracted in some fashion both for interpretation by the next author as well as for a later architectural construction.

Above: Book cover from I Send Your This Cadmium Red, by John Berger and John Christie
Below: page from the book: correspondance re: the word "blue"

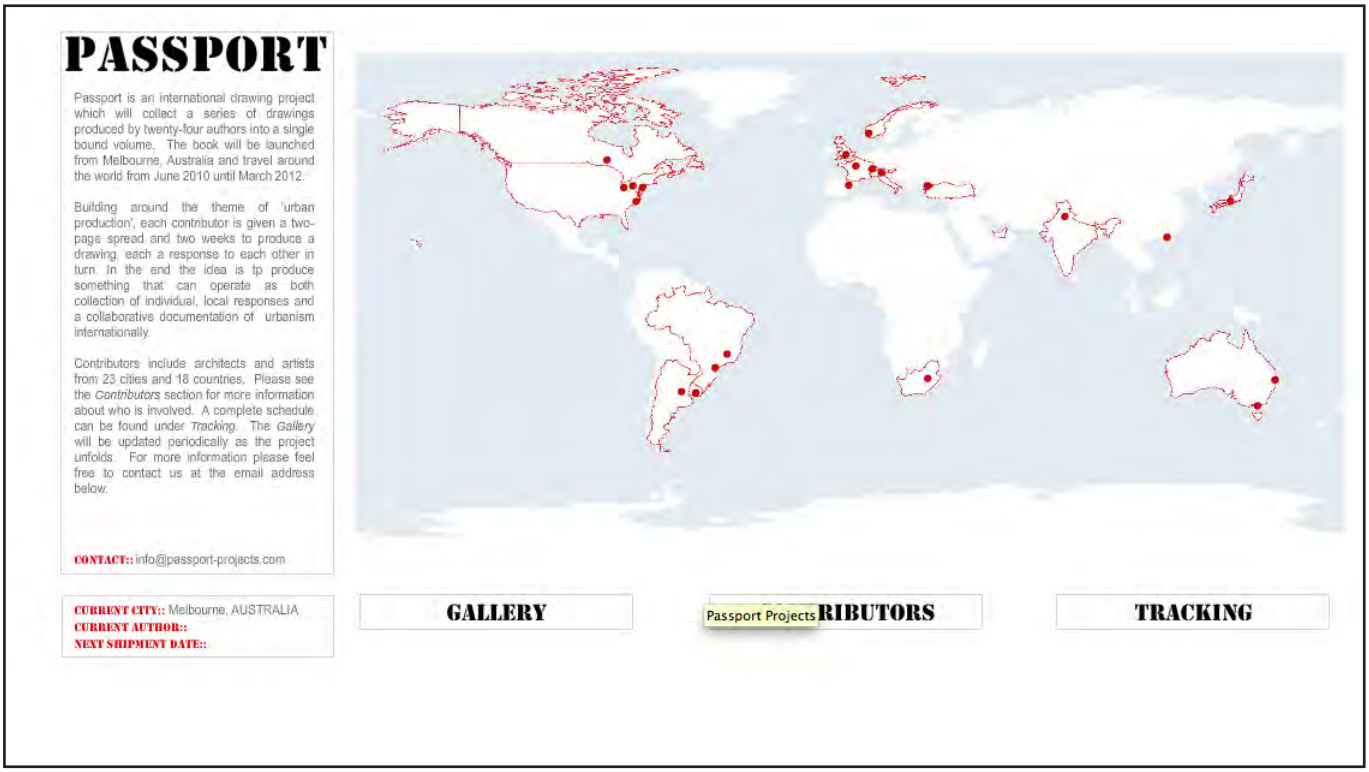
While the drawings were collected in the physical book, a web-based interface, or 'viewport' aimed at a public audience was also produced. The website captured digital information for each contribution, including logistics and tracking data, links to related projects or ideas, works in progress, comments and contributor information. This virtual book-space was designed to track the progress of the drawing/document and also to contribute to it, providing a non-linear and non-chronological counterpart to the physical book. It also provided ways for contributors to link the digital project (web information) with the physical project, a very nascent experiment with internet-objects. Rather than orchestrating a seamless collaborative platform geared towards a perfect finished project-object, this project endeavoured to introduce gaps in authorship, time and space. This was an effort to avoid full cohesion and completeness and encourage instead less predictable outcomes, while maintaining a common theme.

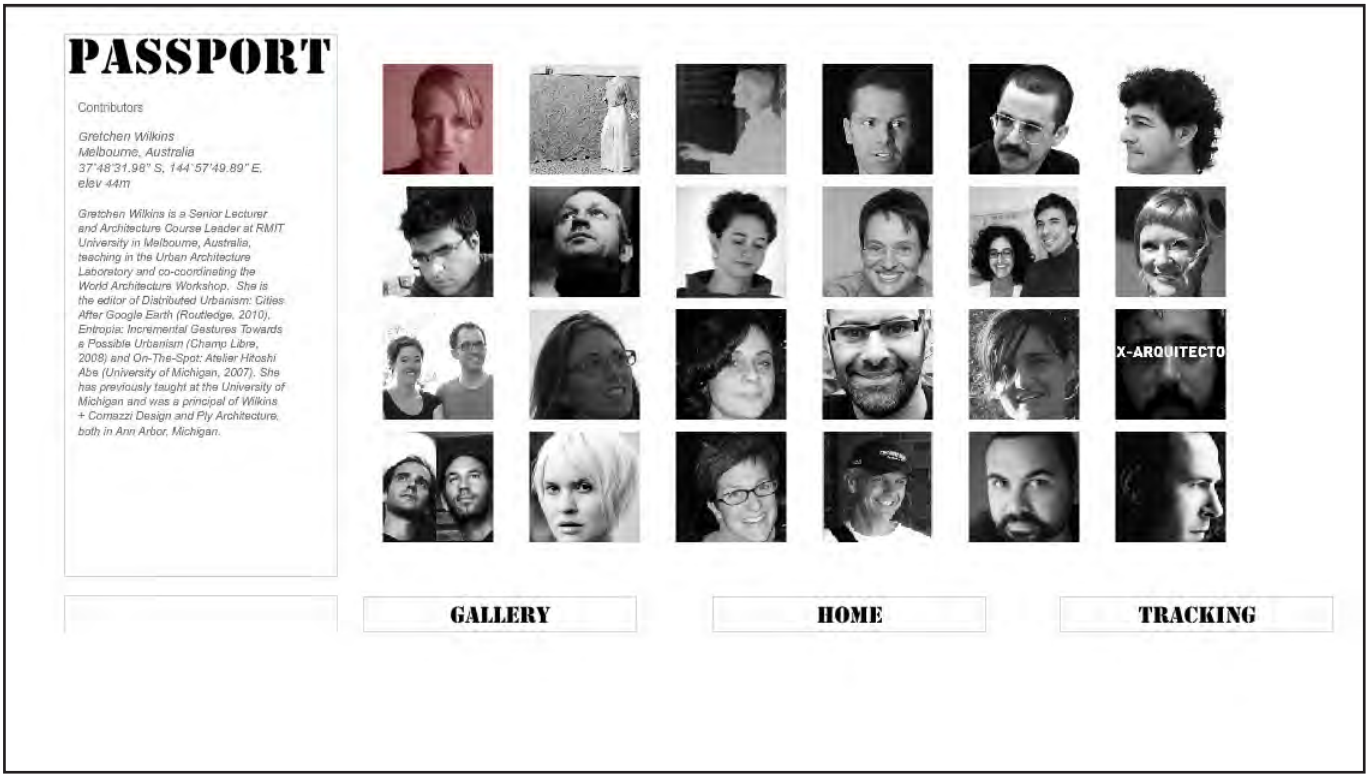


Passport Project: Melbourne (by author) book entry (2010)

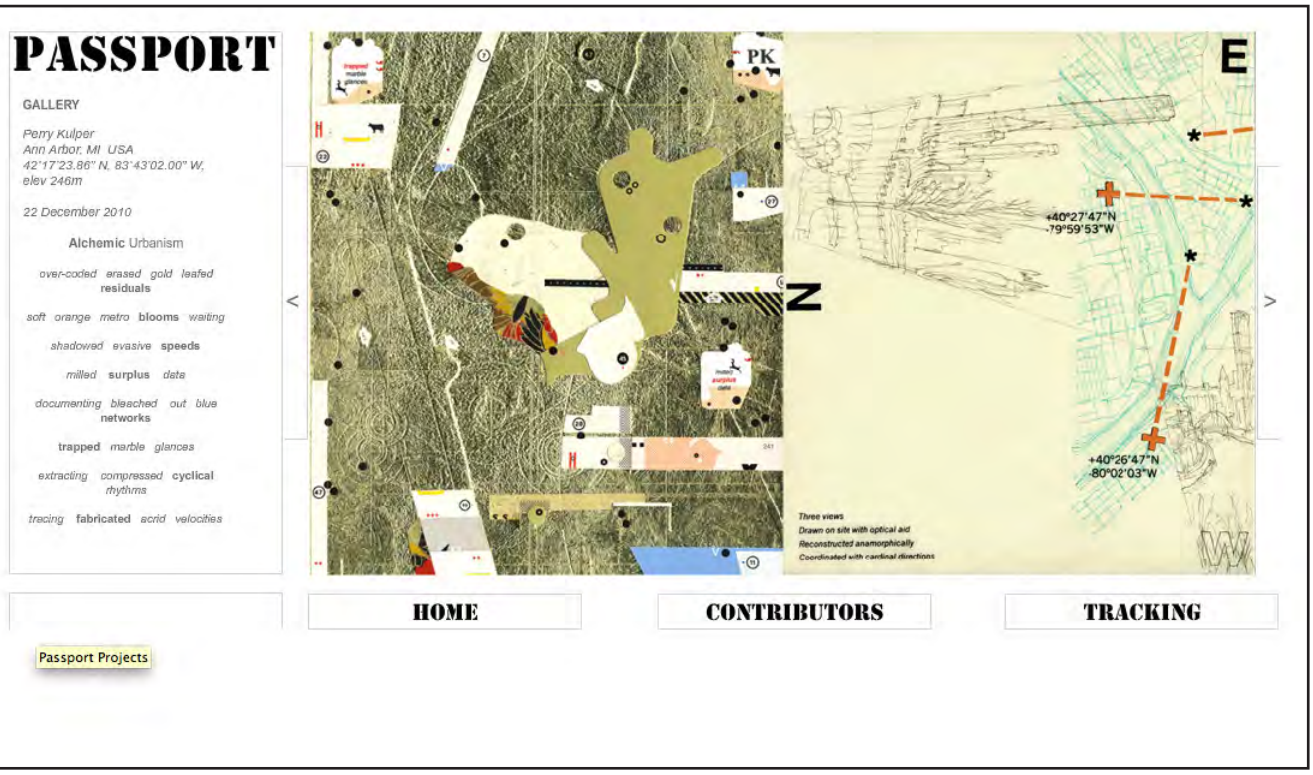


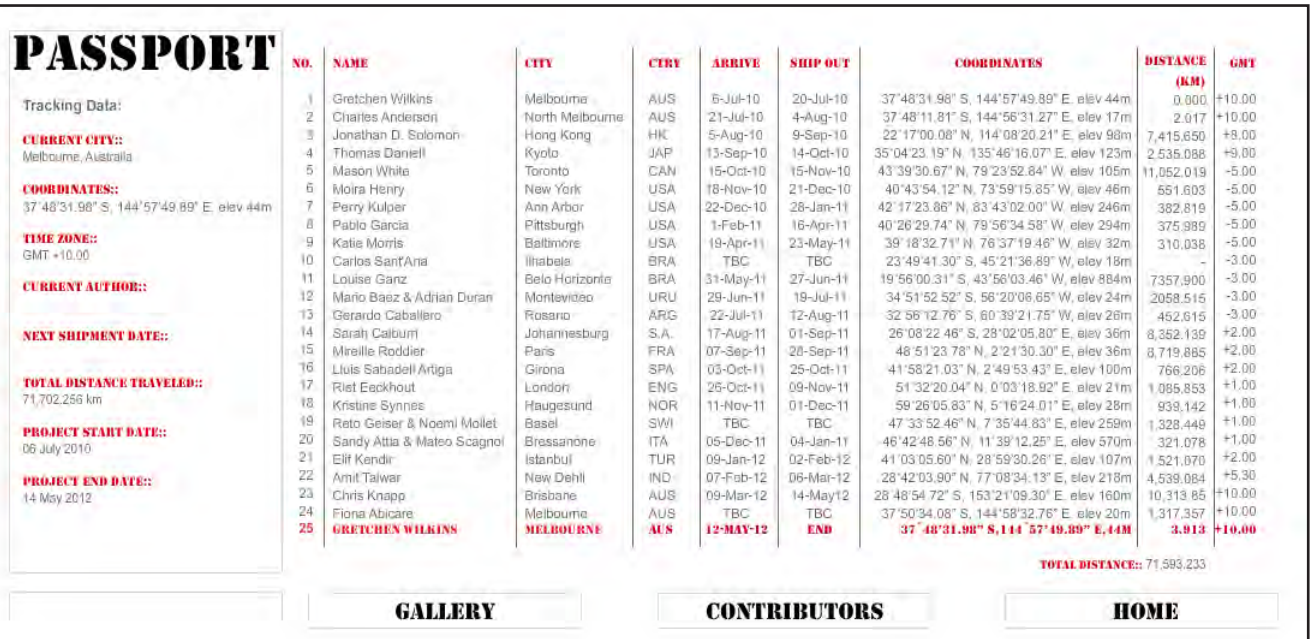
Passport Project: Melbourne (by author) digital drawing (2010)





Passport Project: website
Above: Home page
Below: Contributors





Passport Project: website
Above: Gallery Pages (Kulper and Garcia shown)
Below: Tracking data page with contributor names

introduction

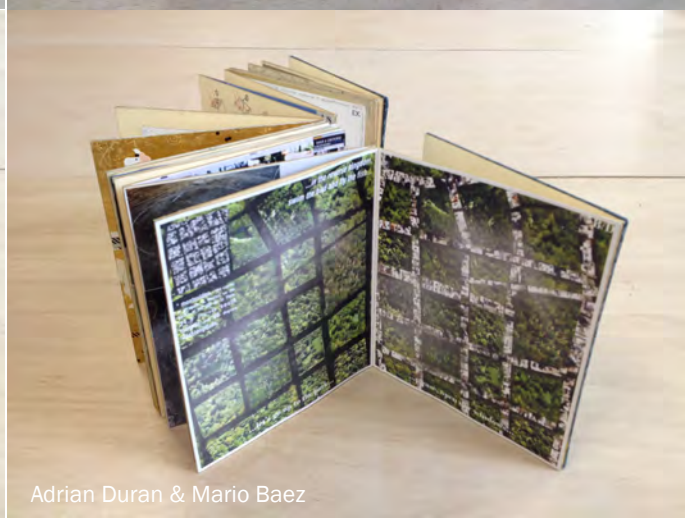
Jonathan Solomon

Thomas Daniell

Perry Kulper

Pablo Garcia

Louise Ganz

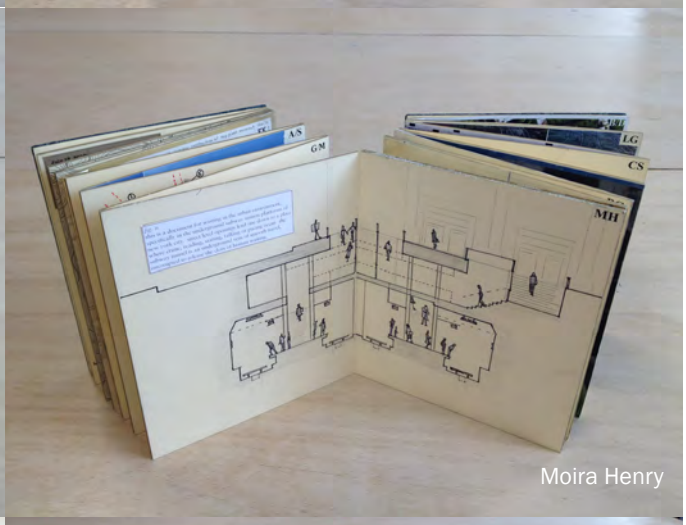


Adrian Duran & Mario Baez

Gretchen Wilkins

Charles Anderson

Mason White



Moira Henry

Katie Morris

Gerardo Caballero

Sarah Calburn

Elif Kendir

Sandy Attia & Matteo Scagnol

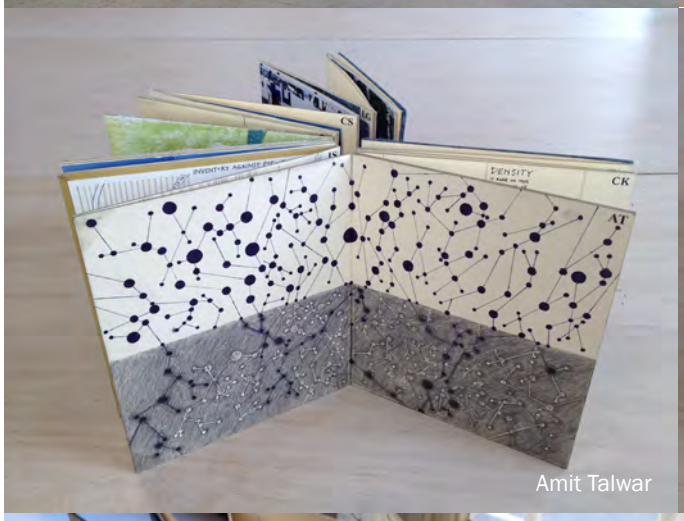
Reit Eeckhout

Elif Kendir


Mireille Roddier


Lluis Sabadell Artiga


Kristine Synnes


Amit Talwar


Chris Knapp

3. TankView

TankView, a collaboration between myself and John Comazzi, is an ongoing project exploring the repurposing of abandoned or obsolete infrastructure in cities. It began as a submission for a competition in Chicago, and went on to win, in a different format, a competition in Portland, Oregon.[21]

The focus of this project is the reuse of roof-mounted water tanks. We proposed they could be coupled with various modes of photography to capture the city roofscape and spaces typically unseen and unoccupied. As an enclosed space surrounded by light the water tank is a ready-made camera obscura, a dark room requiring only a small opening in one wall to fill the space with light and capture images of the surrounding city. By inserting a series of photographic surfaces and web cameras within the tank, the captured panoramic scenes can be permanently recorded on a variety of media and re-presented back in any number of ways. Images may be transferred onto metal, plastic or steel surfaces and wrapped around the tower, lit from behind to glow like 'windows' at night, printed full-scale on fabric and draped like clothing, or mounted as billboards throughout the city and beyond. The digital files can be uploaded and integrated with open-source virtual globes such as Google Earth, so that anyone globally can view the city from the perspective of the tanks – a position somewhere between the aerial view and StreetView, which we called 'TankView'.

The images produced from this process are details and fragments of the surrounding context that alone yield an incomplete picture, but when viewed collectively render an

"Remembering and recollection today have achieved new importance as the contemporary metropolis becomes a source of constant exchanges in and relays of information, and represents a physical site in which images and messages seem to swirl about, devoid of a sustaining context..."

– M. Christine Boyer (20)

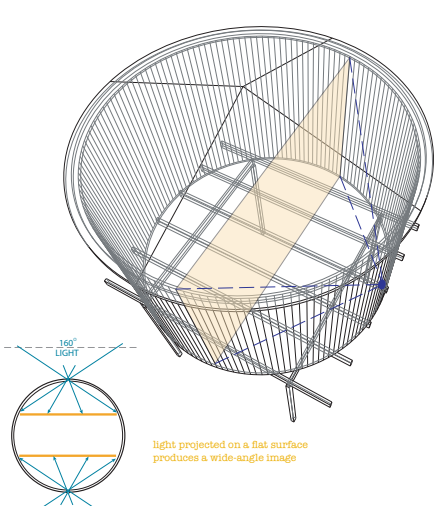
20 BOYER, M. C. (1994) *The City of Collective Memory*, Cambridge, MIT Press.

21 Tank View project was authored in collaboration with John Comazzi

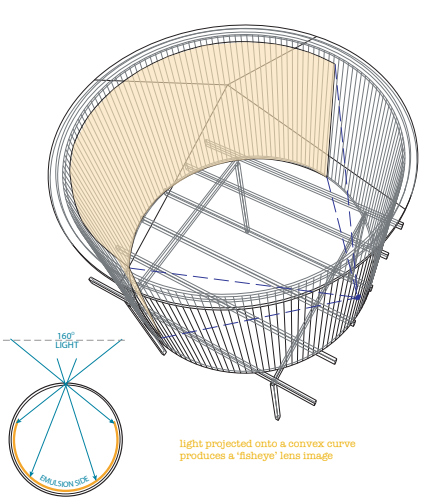
alternative, vicarious experience of the city from above. Eight towers were suggested for reuse in the Portland proposal, but the strategy is transferrable across any type of elevated, disused storage tank. Ultimately the tanks are repurposed to capture a 'twin' city that can be presented back onto itself in place, or distributed across a series of local and remote 'sites', touching on ideas of urban 'twinning' referred to in Chapter 2.

The ongoing TankView project allows for a reappraisal of the tanks' role as urban infrastructure. Our interest was in extending the lives of these water tanks not as inert and preserved urban artefacts, but as urban equipment actively participating in the construction of cities' ever-changing, collective imagery and memory. The images produced from our reconfiguration of the tanks capture fleeting moments in the form a material document, a durable recording of the unseen and slow moving life of the city. It also captures real-time video feed of the current conditions of the city, including weather, sound, events or changes to the skyline over time. It could be linked with Cosm[22] to feed environmental data to other projects in combination with visual imagery. While the project itself is specifically designed and authored, including the location, view, media, method and host of other decisions that contribute to the quality and idiosyncratic nature of the outcome, the ambition is that those images are source material for future work. They can be viewed remotely, or incorporated into other projects by other authors. The scenes can be exhibited in other parts of the city, subways, public parks, gallery interiors or across the world, for example. As image-makers, the tanks aggregate and archive a unique view upon cities' material and temporal history for public experience and future production.

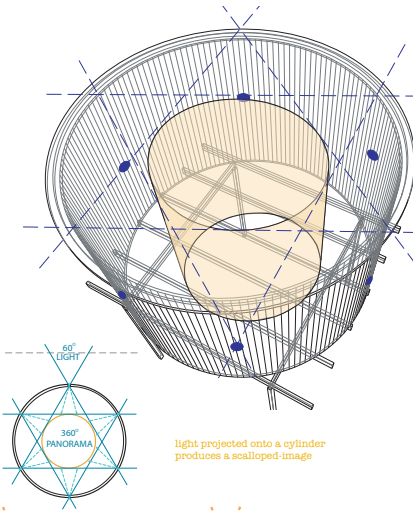
22 Cosm (formerly Pachube) links data and objects through web-based interfaces. <https://cosm.com/>



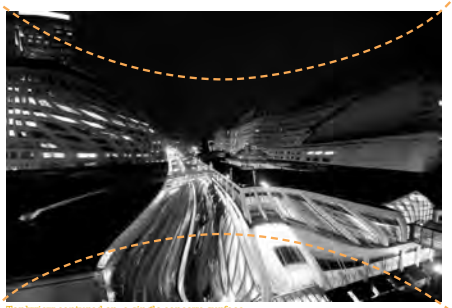
light projected on a flat surface
produces a wide-angle image



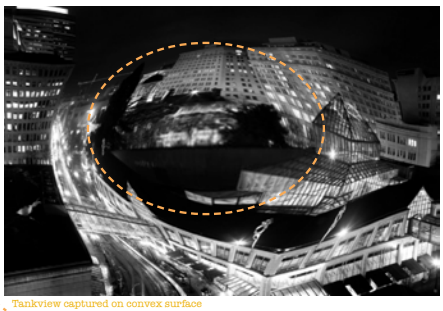
light projected onto a convex curve
produces a 'fisheye' lens image



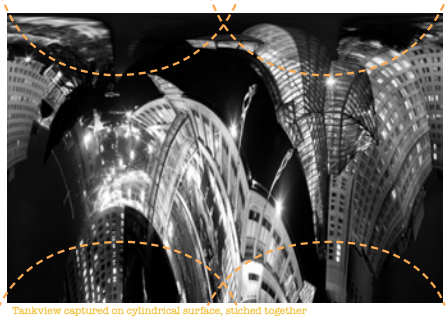
light projected onto a cylinder
produces a scalloped-image



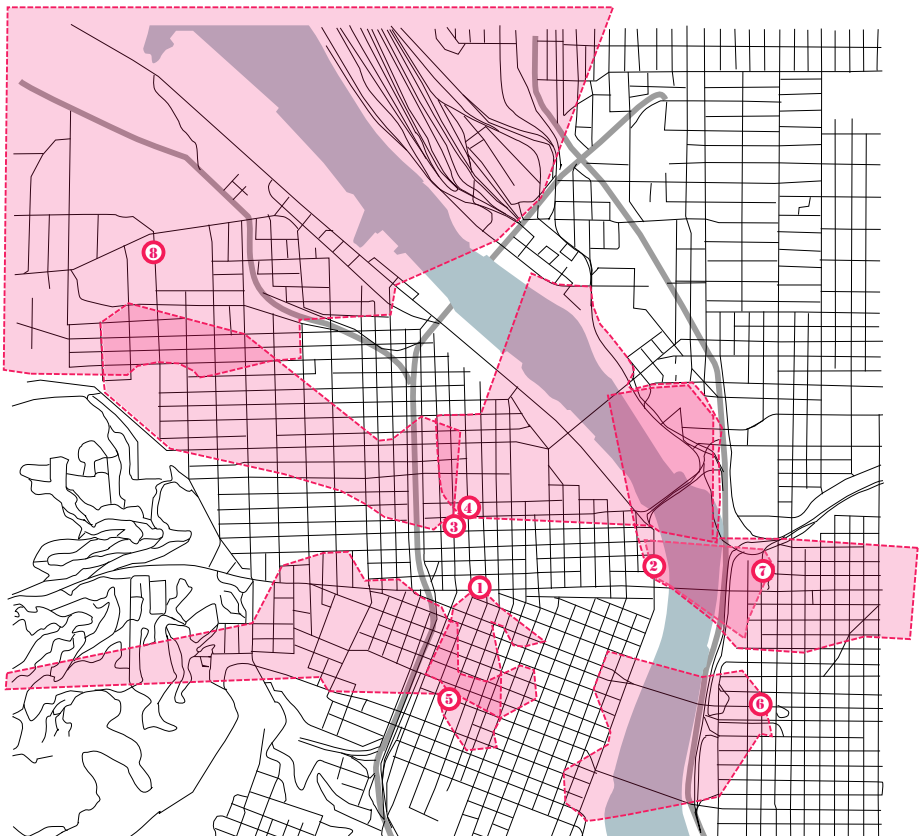
Tankview captured on a single concave surface



Tankview captured on convex surface

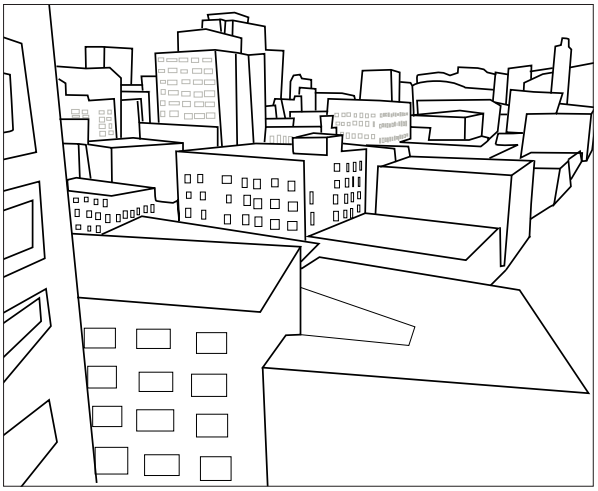


Tankview captured on cylindrical surface, stiched together

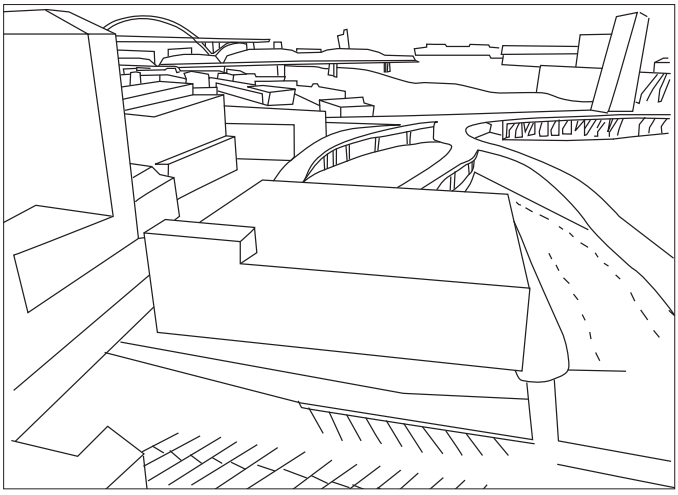


COVERAGE MAP: locating the eight selected tanks in central Portland, indicating views: 1. W. Burnside 2:Old Town 3:Chown Pella W 4:Chown Pella E. 5:Main Street 6:3rd Ave. 7:Love 8: 26th St.

TankView project
Competition drawings for
Portland (2011)

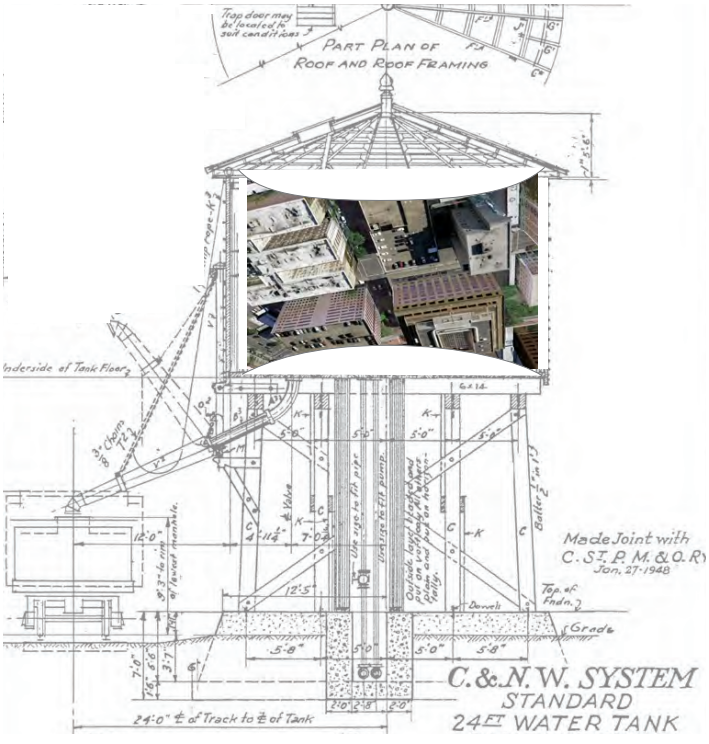


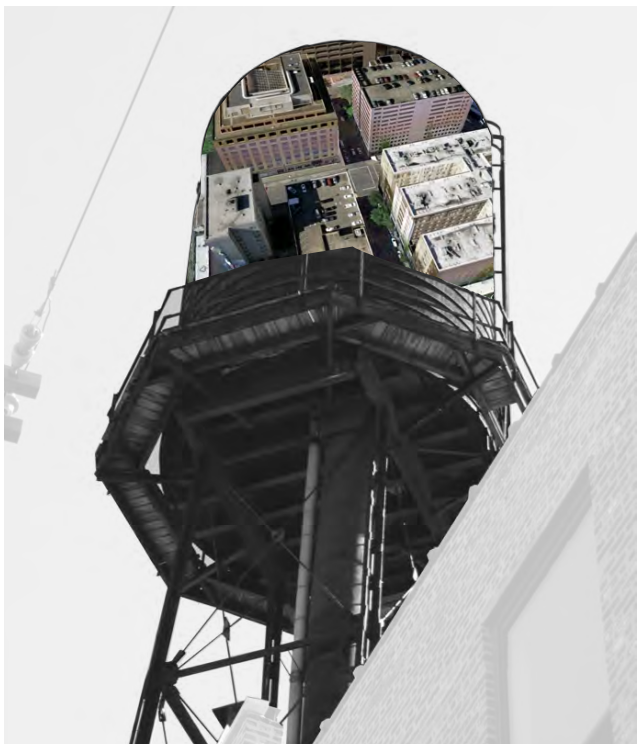
view from West Burnside tank (1)



view from Old Town tank (2)

URBAN EXHIBIT: The images can be exhibited throughout the city, displayed on the towers themselves and uploaded for access through Google Earth.

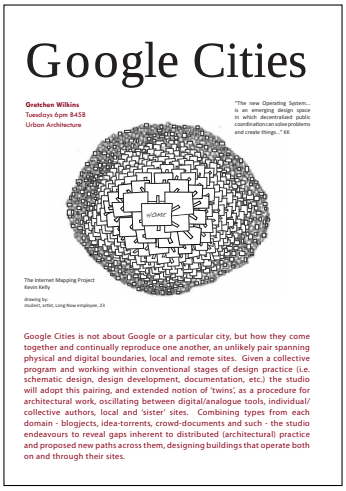




CAMERA OBSCURA: section of a typical tower showing how the image is projected within the interior of the tank and represented externally

4. Google Cities

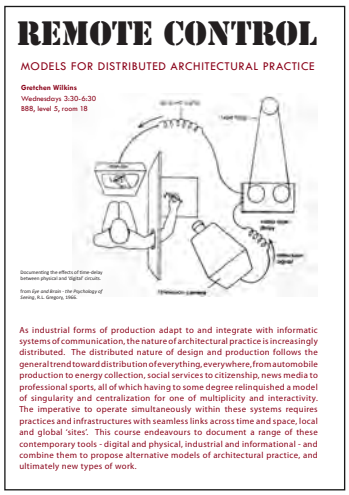
Google Cities is a combined design studio and research seminar I ran in the Architecture program at RMIT University from 2010-2011. The ambition of the combined coursework was twofold: to explore the relationship between virtual and actual cities in terms of perception, documentation and design, and to explore the tools and techniques by which this form of distributed design and architectural practice could occur professionally and logistically. This was developed through architectural design projects in design studio, and research projects in the seminar.



Google Cities design studio poster (2011)

Google Cities is therefore not about Google or a particular city, but how they come together and continually reproduce one another, an unlikely pair spanning physical and digital boundaries, local and remote sites. Given the collective program format, and expectation that the program would develop within conventional stages of design practice (i.e. schematic design, design development, documentation, etc.) the studio proposed to adopt the paired virtual and actual city as a procedure for architectural work, oscillating between digital/analogue tools, individual/collective authors, local and 'sister' sites. Combining these realms, the studio endeavoured to reveal gaps inherent to distributed architectural practices and propose new paths across them. The final project brief was to design a World Expo building for two sites, one locally (Melbourne) and one remotely (a Sister City of Melbourne: Thessaloniki, Osaka, Boston, Tianjin, St. Petersburg or Milan). This could be approached as one building designed for both sites and adjusted accordingly, or they could design two different buildings of the same program for the two complimentary sites. In both cases the manner in which spatial information is apprehended and translated from local and direct sources as compared to remote and virtual sources was a fundamental design research question and provocation.

It also necessitated research into the cultural or other links between Melbourne and its Sister Cities in the first instance, such as connections to fashion in Milan, universities in Boston or performing arts in St. Petersburg. This touched upon the qualitative aspects of urbanism discussed in the *Passport Project,* however here it was virtually accessed and understood not directly experienced. Nonetheless, the ambition was to establish a twinned or otherwise comparative framework such that gaps between them would be revealed. This was then used as a source of design experimentation and required students to position their practices relative to that framework.



Remote Control research seminar poster (2011 - linked to Google Cities)

The studio experimented with the ideas described in the Distributed Urbanism Introduction, underscoring shifts in the making of things from the assembly line to the network cloud, from the localised to the distributed, and from physical models to virtual interactions. We gave special attention to the use of digital fabrication technologies for remote collaboration and production in architecture. For example how the construction of their building could be fabricated remotely, interactive across both sites, or simultaneously occupiable across both sites (merging virtual and physical space)

While the studio proposed architectural design projects, the elective, offered separately, researched the structures of distributed professional architectural practices. This included a catalogue of contemporary 'tools' used to connect data across networks of people and places. These tools, as was the case in the *Whole Earth Catalog,* were relatively wide-ranging. They included open-source, free-ware and other available design tools or platforms, design collaboratives and resources, imaging programs and remote fabrication facilities. Ultimately each student was required to propose a model of distributed practice relative to a proposed practice structure.

The brief for the research component stated as such:

> As we rapidly accelerate toward an 'Internet of Things' environment, where places and data are seamlessly integrated and the web is the universal operating system, the boundaries between things and places don't matter so much as the tools we use to navigate across them. Architectural production is slow, and so is its tendency toward change, following behind the curve of almost any other discipline in technological innovation and advancement. But tools of cultural production, by contrast, proliferate at dizzying speeds, quick and dirty, fast and cheap. And as these tools infiltrate architecture, as the mechanisms of design and production are increasingly integrated with those of cultural production, we get closer to the domain of what Kevin Kelly calls the "New Socialism," environments shaped by everyone, for everyone. How do we apply to architecture what the medical sciences apply to the body? How do these tools change the manner in which we make things akin to how Google is reshaping 'earth' and Facebook is redesigning friendship?
>
> Within the much broader spectrum of distributed tools and practice, the ambition of this course was to document specific cases in which architects opportunistically harness methods and media for new forms of work and new types of collaboration – remotely and locally. Collectively this work will exposed a range of contemporary tools – digital and physical, industrial and informational – and documented their implications for what architects make and how. Ultimately the

goal as to speculate about and propose your own models of distributed practice and production.

This work involves producing case studies of remote design agencies and distributed practices, beginning with the following four models:

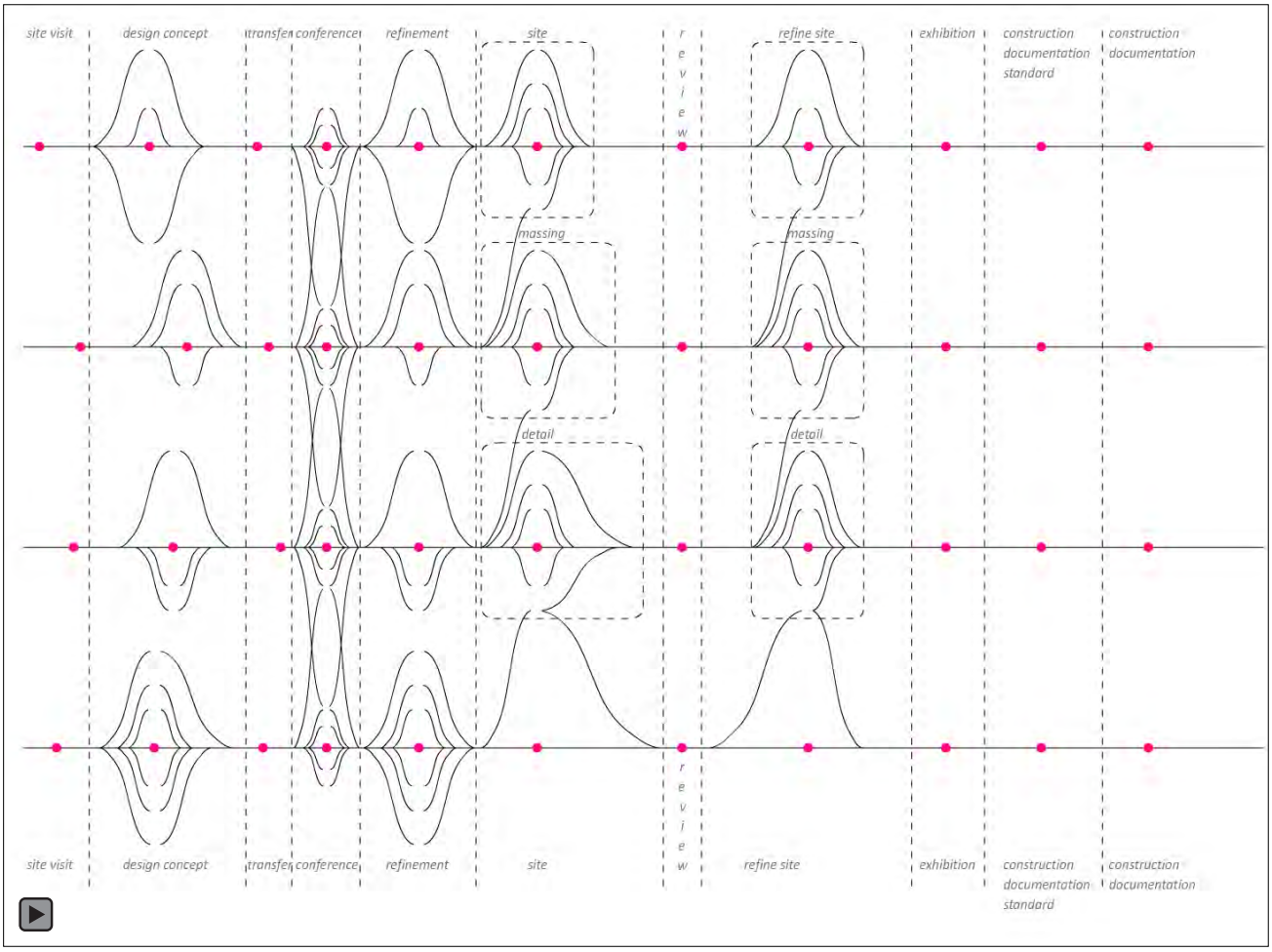
Localised Hub (centralised space)

Virtual studio (collective, remote space)

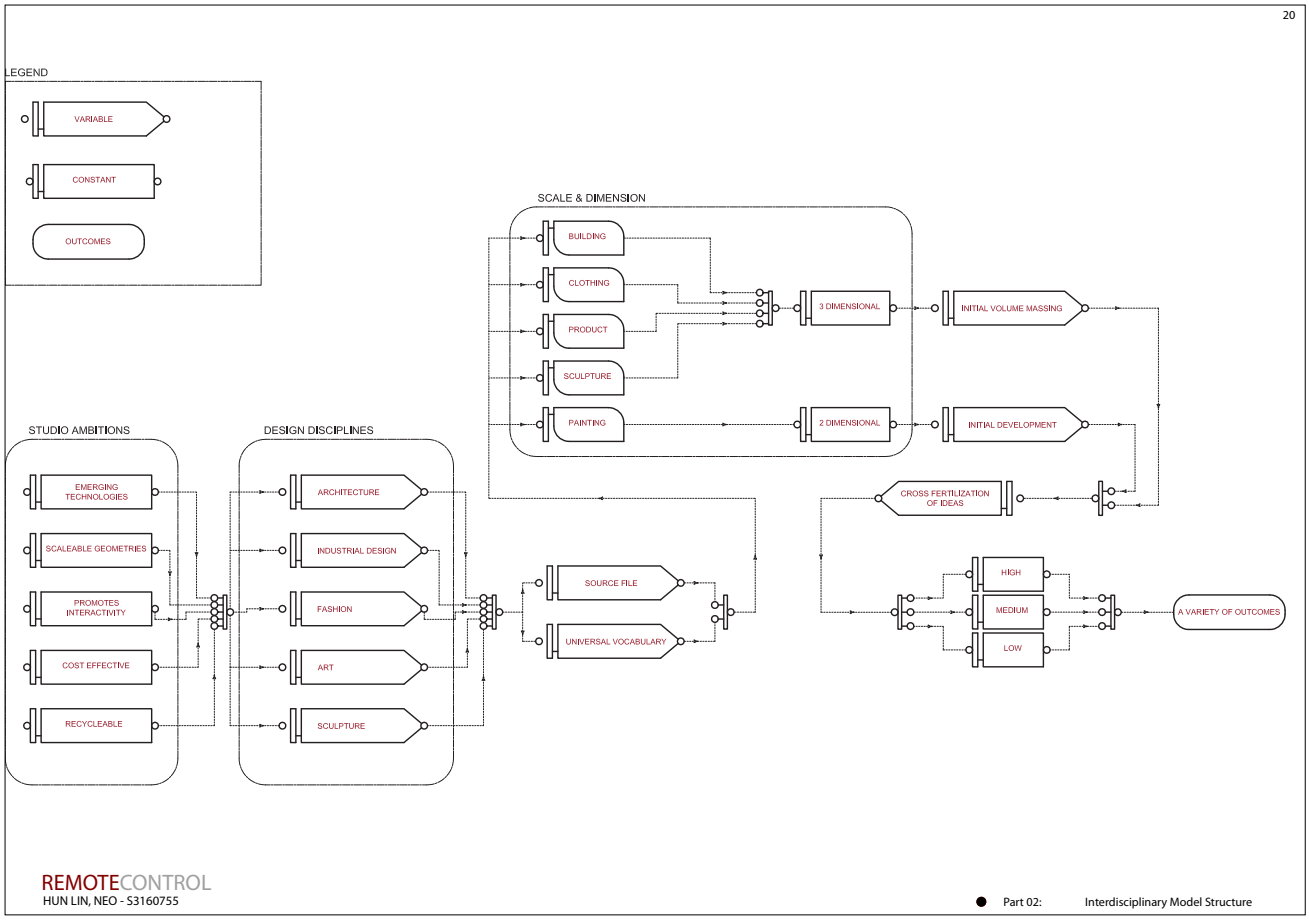
Mobile studio (unfixed, rotating or shifting sites)

Project Bureau (by-project collaborative)

The proposal hinged on students' position relative to questions of authorship, architectural identity and design practice in general. Inherent to each of the models provided is a cultural and economic agenda or implication. Not all types of work are conducive to all types of practice structures. As with the impact that graphic communication has on construction, the way a practice is structured will impact upon on the work it produces. This relates to a variety of factors, including the types of projects undertaken, the approach to design process and to construction, as well as financial and legal implications. The goal pedagogically was to interrogate the mechanisms through which design process and professional practice operate in a distributed environment. That process triggered a secondary outcome, an expanded understanding of architectural practice in general and in terms of each student's individual position within it. The course also provided a broad exposure to the types of existing distributed practices within architectural design, through specific research into offices, organisations, collaboratives, and the variety of tools and techniques they employ. Producing their own model for practice, including a description of intended outcomes, was an opportunity for students to both locate and design the intersections between these variables. This emphasised flexibility and fluidity within design practice, with the aim of exposing students to alternative models for their own future practice.



Remote Control 'scripted' architectural practice (student: David Christiansz)



Remote Control 'scripted' architectural practice (student: Neo Hun Lin)

Conclusions

This chapter has addressed the core location of my current architectural design, writing and teaching practice, situated between urbanism and manufacturing. The focus of this work involves structuring projects for ongoing or open-ended participation. This includes establishing collaborative modes of engagement across disciplines, expertise and technologies and developing more complex links between the practices of writing, teaching and design.

Each of the projects does this in different way, which is partially due to differences in the modes of working (teaching, writing, etc.), but also a because of a deliberate shift in how the original question about authorship is put to the work. For example, borrowing from the *Google Cities* practice models, the *Distributed Urbanism* book operates as a version of the 'Project Bureau'. All of the authors were working independently on a piece of work that shares the 'space' of the book. The project was formed around the authors, and when the project was complete so was the collaboration. Future collaborations may however be formed from that transitory project, either through overlaps in the book's content (projects aligned around Google, or depopulation, or Detroit, for example) or because of newfound links between the authors.

Continuing with this analogy, the *Passport Project* is best aligned with the Mobile Studio model, as the project roamed from city to city, site to site, and author to author, unfixed from one space. This is an unlikely scenario for a real architectural project for obvious reasons, (except perhaps in the case of a demountable Expo building), but the benefits are that authors can maintain their local practice while contributing to a larger, globally

structured piece of work. The *Passport Project* is also well aligned with the Virtual Studio model, as the virtual web-space of the 'digital passport' allowed interactivity across geographical or physical boundaries, and participation at any point in time rather than strictly according to the established timeline. In a more developed version the virtual studio space could employ a host of other techniques for interactivity in design and communication, as well as productive links between local, virtual and even simulated architectural and urban spaces.

As a fixed space that captures information coming though it, the *TankView* project is closest to a Localised Hub model. It is a defined, actual space which allows the flow of information and media through it, as well as the open access of authors and viewers to it. The localised hub has benefits of fixity while allowing flexibility in other dimensions. In that sense it is perhaps an inverse of the mobile studio, which gathers local information as it roams. The localised hub gathers global information as it stays in place.

These projects are all experiments with modes of architectural practice and their implications for project outcomes. They proceed from the position that the structure of practice has direct implications on the nature of the work, and so the design of the practice itself is as important as the design of the projects. This defines what the practice is as importantly as what it is not, how the partners and projects are linked to each other or not. In the end this research is invested in exploring the agency, complexity and productivity of distributed design networks, and has enabled the model for practice discussed in next.

ap·pa·rat·us:

Pronunciation: /æpəˈreɪtəs/

Forms: Pl. (rare) -atus, -atuses.

Etymology: < Latin apparātus, n. of state < apparā-re , adparā-re to make ready for, < ad to + parā-re to make ready.

1. a group or combination of instruments, machinery, tools, materials, etc., having a particular function or intended for a specific use: Our town has excellent fire-fighting apparatus.

2. any complex instrument or mechanism for a particular purpose.

3. any system or systematic organization of activities, functions, processes, etc., directed toward a specific goal: the apparatus of government; espionage apparatus.

4. Physiology. a group of structurally different organs working together in the performance of a particular function: the digestive apparatus.

From Dictionay.com

Chapter 6: Modelling a Future Practice

studio Apparatus

The primary outcome of reflecting on my own and others projects' at the intersection of urban and industrial practices is to produce a vehicle for future professional practice. Studio Apparatus, a new project launched in July, 2012 with collaborator Anna Tweeddale, is designed to operate as a framework for curating and enacting projects within the gap between urban and material conditions and practices, problems and possibilities. The structure of the collaboration learns from industrial manufacturing practices; it is modelled as a 'platform' incorporating essential elements for practice rather than being organised as a complete, holistic brand. The identity develops, in other words, from the work of practice itself, and from the collaborators invited to participate. These include partners in industrial manufacturing and urban economics, artists, urban designers, architects and academics. The ambition is to curate and cultivate a practice geared towards a variety of outcomes, such as events, building proposals, urban frameworks or speculative design prototypes.

Cultivating this approach to practice, Studio Apparatus will focus on contemporary urbanism, and give attention to the types and qualities of sites described in the Urban chapter. These include post-industrial or post-bubble sites, and spaces in the midst of or affected by the dynamics of urban change. Key subjects include changes in population, density, infrastructure, plot ratio and parcelisation, as well as contemporary approaches to manufacturing and production. At the core of this are questions around urban policy, urban economics and development, which is a key research interest and opportunity for collaborative work. The goal is to initiate urban-based projects that operate strategically through design, and build upon partnerships already established across economics and industrial manufacturing.

As an Apparatus we imagine the practice in terms of a tooled capacity to make or achieve outcomes, to itself 'do' work. An apparatus is a mechanism or instrument which enables a variety of outcomes. It is designed and constructed in order to design and construct other things. We use this name quite specifically for these connotations, envisioning a variety of types of work it can produce across urban and architectural realms. This notion of

apparatus echoes Jacob's approach to practice that I have drawn upon in Chapter 4: that work begets more work; or more specifically, that labour begets new forms of labour, and also on the discussion of tools in Chapter 5.[2] For example, collaborating on architectural projects with underemployed automobile manufactures (discussed in Chapter 4), as well as repurposed, materials and industrial techniques. From one expertise another is derived, or from one material application another emerges. By focusing on work as something continually in progress, and also that it can be produced (rather than only granted), Apparatus will act as a tool for multiple design practices.

"Economic forces that govern successful enterprise are counter to other forces that make architecture a successful profession, and this is what creates a dynamic of change and transformation. "

– Judith Blau (1)

We also envision Apparatus as a research laboratory, insofar as it is a space within which ideas can be tested through work. Recalling the discussion from Chapter 1, in which the Expo building was positioned as a test of, or translation of, utopian ideas, we endeavour to use prototypes, projects and constructions as ways to test ideas. These ideas will specifically derive from our interest in the relationship between urbanism and manufacturing, which may yield a wide variety of project types and combinations. We are interested in research through the act of designing and constructing, and also in strategies for open-ended participation and collective authorship, pointing to the practice of prototyping as a driving methodology. The prototype is both real and ideal, both complete and incomplete.

In many ways this practice is also informed by our independent teaching experiences. The design studio environment also acts as a research laboratory for testing ideas derived from 'real-life' scenarios or hypothetical questions, and doing so through design proposals. Triggers from existing professional, cultural or technological realms are used to instigate a process of design experimentation, in which case the boundaries of the question itself are also examined. As a collective environment a variety of proposals are generated, and the feedback between them provides another layer of detail or question for the work. While the projects are speculative the questions they ask are not; the results have traction beyond the limits of academic, laboratory environment. The projects are real and unreal at once, they may be impossible to construct, or reproduce, but elements of them are transferrable or translatable elsewhere. The interplay between real and speculative work will be a focus of the practice especially through the processes of prototyping and the development of strategic frameworks.

Finally, Studio Apparatus's agenda toward practice is strongly invested in collective project structures, and related to this, the agency of incompletion. This is reflected in the

1 BLAU, J. (1987) *Architects and Firms: A Sociological Perspective on Architectural Practices*, Cambridge, MIT Press, p143.

2 The notion of 'tools' in urban practice refers also to David Grahame Shane's writings, specifically *Recombinant Urbanism* and *Sensing the City*.

"If you really want to change the city or want a real struggle, a real fight, then it would require re-engaging with things like public planning for example, or re-engaging with government, or re-engaging with a large-scale institutionalised developer."

– Dan Hill, SITRA (3)

name – Apparatus connotes an enabling, tool-like relation to all range and multiplicities of engagement – as well as a particular structural and structuring orientation between the partners and projects. We have devised the practice with gaps inherent, an effort to imbue some of the creative potentials these gaps afford. Indeed, we spent as much time discussing how to embed discontinuity, non-closure, and unplanned collaborative possibilities in to the company model as we did making the future practice tangible, legible and strategic. Our aim in developing such an approach has been to give as much agency to the voids and disconnections in our practices and sites of work, as to the accumulation of knowledge and ideas. This is an idea of agency found by proximity to the gap and to incompletion, to the notion of 'work begetting work' that I have elaborated upon throughout this document. We have devised the structure such that the practice can be maintained as a scaffolding and not as a finished or predetermined thing. We see this as a resilient and self-propagating gesture, and as a way to engender, through incompleteness, the longevity of our future work.

The set of guiding principles that we have therefore co-developed for the work are thus:

- Studio Apparatus is a vehicle for practice, staging architectural projects and partnerships at the intersection of urbanism and industry, including both economics and manufacturing.
- The structure of the practice borrows and develops notions from manufacturing and mass production; it is modelled as a 'platform' around which a project, brief or event is formed. It can assemble (or disassemble) accordingly.
- Studio Apparatus is focused on urban projects, prototyping, urban economics and contemporary industry
- Studio Apparatus operates at the intersection of other practices. It does not include everything. Independent projects happen in parallel, other projects may seed ideas to Studio Apparatus, or overlap occasionally, but such work remains otherwise independent.
- Apparatus is not an envelope but a framework – a skeleton upon which projects, collaborations and ideas build. It is interested in collective structures of creative work.

3 HILL, D. (2012) 'Dark Matter & Trojan Horses: A Vocabulary', lecture at the University of Melbourne, 27 March 27 2012, accessed 8 April 2012. <http://vimeo.com/39565431>.

Finishing on the verge: future practice

The conclusion of the reflective process of this PhD has produced two primary contributions: an articulation of creative practices at the intersection of industry and urbanism (Chapter 5: Network Practices); and a model for future practice to directly engage this space of work, which I have laid out above. Having worked through the issues of post-industrial and post-bubble cities in my writing and design studio teaching over a decade, and having tested architectural applications for recycled industrial materials through workshops, studios and design projects, the question for my future practice is how these can be brought together in a new way. I have co-developed Studio Apparatus as the vehicle through which to do so; this new project marks the beginning of a process yet to unfold. Although it emerges during an extended moment of critical reflection, it is primarily working as a springboard for future work, rather than as a conclusion to academic labour.

Some of the research of this PhD will directly serve as the springboard, as many of the projects here suggest many possible future iterations, developments, or continuation. The *Passport Project,* for its emphasis on collective authorship, distributed project structure and focus on contemporary urbanism, has been influential here and will continue through a future publication and construction project. The nature and types of links between virtual and physical content is a key focus there, as well as the next stage, or translation, of the drawings. The *Google Cities* coursework has provided an ongoing platform for continued architectural pedagogy in both design studio and research seminar modes. *Google Cities* will continue to speculate about the distributed nature of cities in general and the nature and types of virtual tools and technologies in particular, such as Google Earth, Photosynth and other interactive, collectively authored visualisation and design platforms. The *TankView* project brings these interests together in an architectural and urban way, recycling outmoded infrastructure of the industrial city and exposing the local conditions of a city to a global public through analogue and digital photographic techniques. This project could expand to produce an extended network of interactive and accessible portals to the spaces of cities that are not accessible even locally, as well as find new links between virtual and physical spaces of cities.

The future of these projects and of my practice as a whole, which will now take shape through the platform of Studio Apparatus alongside ongoing teaching, writing and

research, will continue to be located between the dualities stated at the outset of this document. That is, between utopian and pragmatic design approaches, between fictional and factual urban boundaries, between local and global sites, and between digital and physical techniques and spaces. In lieu of a comprehensive summary or conclusion, (which would indeed be antithetical to the nature of this particular PhD) I'd like instead to indicate a series of key words that most strongly frame the present and future work, and which will orient the way in which my future practice will unfold through research, teaching and project development. Drivers of practice:

"Anyone who totally knows what they are doing, is boring. And so also, someone who is in love with architecture, doesn't know what it is."

– Mark Wigley (4)

***Prototypes**: emphasising complete-incomplete states of work, execution, and how project dynamics can shape policy (and the city), and not the other way around. Construction as research*

***Unfinished**: Designing the endgame of projects, resisting completion rather than seeking it. Ensuring multiple trajectories of development in an urban context; Towards perpetual completion.*

***Strategies:** Approaching projects in ways that seed multiple outcomes, finding new connections between new 'data' sets.*

***Residuals:** revaluing, repurposing, reinventing outmoded or disused space, technology, technique, skills, or materials.*

***Agency**: enabling more work through work; Production as a shared enterprise.*[5]

This body of design research, thereby, finishes on the verge of the next. To summarise the findings and developments of this reflection period is to still refrain from final conclusions of how all of the threads tie neatly together into a composite project. My emphasis has in fact been on working towards the opposite, and my practice and research will continue to be developed in this way. The PhD process has through this model instead served to identify and articulate the most dynamic alignments taking place across a series of my own (and others') projects which may not have been explicitly perceived or designated before; and then, to point to new gaps or spaces of work that might unfold as next iterations of these reflections. The result of this kind of connectionist, open-ended attention to a past and future of practice in this PhD, is that the PhD itself contains within it ideas about future utopian projects and their connections 'back to earth'. These connections will be made through new approaches to and organisations of practice, many of which are as yet unformed. At the same time, the work will purposefully continue to be focussed through contemporary manufacturing and the increasingly accessible tools for materialising and imbricating ideas and data, tools and materials for broad participation

4 WIGLEY, M. (2009) In an interview with David Basulto, ArchDaily, accessed March 18, 2009. <www.archdaily.com/17252/ad-interviews-mark-wigley/>.

5 AWAN, N., SCHNEIDER, T., & TILL, J., (2011) *Spatial Agency: Other Ways of Doing Architecture*, Abingdon, Routledge.p29

and collaboration. Ultimately, what is envisioned here is an approach to architectural and design authorship that endeavours to be open, ongoing and unfinished. It is this approach that I have practiced, reflected upon, developed and explicitly proposed in different ways across the work of all four chapters.

In chapter two I identified a model for 'staging' or prompting practice by considering the relationship between completion and incompletion through the coupling of utopian schemes and Expo buildings. In this example the inherent impossibility of utopian plans presents a crisis for completion, or 'closure,' and this triggers, and requires, multiple translations of work. Each is an incomplete iteration of the original, although complete in and of itself. Expo buildings are one example of this iteration, a testing of 'unreal' ideas through real constructions, and seed for the continued trajectories of development.

In chapter three I identified the opportunities for innovative practice within unfinished cities, defined as those that are still economically permeable and programmatically diverse. A proposition was offered towards maintaining these qualities and opportunities in the face of urban transformation, generally collected as acts of resistance against a predominant momentum of either growth or decline, working against the grain or establishing a new one in an overly ossified context. Examples of productive unfinishedness were demonstrated in a cumulative comparison of urban shifts in Detroit, Tokyo and Dubai.

In chapter four I identified the type and manner in which new or adapted material practices emerge from outmoded ones. This was exemplified in the context of post-industrial Detroit, but also evidenced through new urban growth such as Zhejiang, China. This established a proposition by which new types of work, skills or material uses might diversify and proliferate, leading to new forms of architectural practice. This has demonstrated effects on urban environments and prompts new forms of architectural practice.

In chapter five these observations and propositions were reflected on towards a proposition for creative incompletion. This suggested, in fact, a model of creative completion, whereby the endings of design projects and practices are triggers for future work. This was positioned in the context of collective authorship, while marking a specific approach, or apparatus through which individual and collective authorship could coexist, and distinguished from other models that do so towards different ends. Four projects demonstrate this approach in urban-based work, architectural pedagogy and architectural practice.

Chapter six finishes on the verge of a next practice, and chapter – Studio Apparatus – which can be proposed but cannot be fully known yet. It is creatively incomplete.

Exhibition

The exhibition is structured in five parts:

1. Staging Practices: case studies in how experimental design practices inform and redefine professional ones. (Wilkins + Comazzi Design)

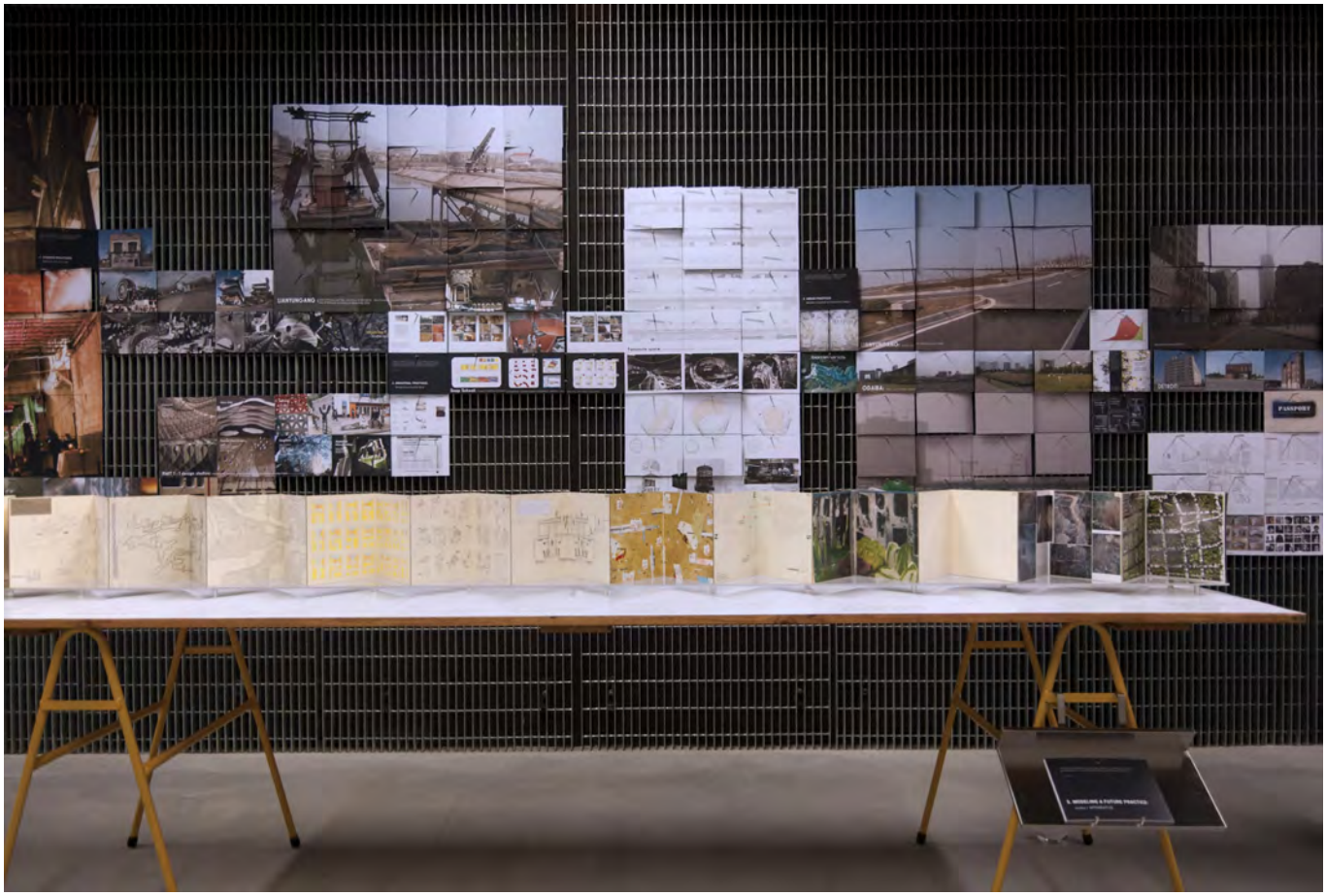
2. Urban Practices: documenting qualities of urbanism between phases of industrial or economic change. (Detroit, Tokyo, Dubai)

3. Industrial Practices: experiments with materials and methods of manufacturing in architectural work. (Fab-Pak, Snap School)

4. Networked Practices: architectural experiments between manufacturing and urbanism. (Passport, TankView, Google Cities, Distributed Urbanism)

5. Modelling a Future Practice: a platform for collaborative architectural practice at the intersection of urban/economic and industrial/material concerns. (studio Apparatus)

Photos from the PhD exhibition and examination, October 18, 2012




Google Cities
TOOLS OF DISTRIBUTED PRACTICE
PASSPORT
TSUKIJI MARKET

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